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The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

An Illustrated Record of Mining, Metallurgical, Railway, Financial, Industrial, And Engineering Progress.

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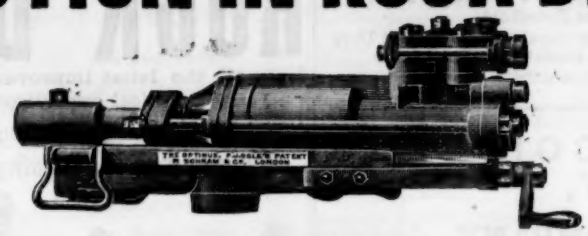
For Index to Advertisements see Page 598. For Literary Contents see Page 612

INDEX TO ADVERTISEMENTS.

(THOSE WITHOUT NUMBER OF PAGE DO NOT APPEAR IN THIS ISSUE.)

REVOLUTION IN ROCK DRILLING



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Belvoir, Grantham,
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SIRS,—Elliman's Royal Embrocation is used in my stables; I think it very useful.

RUTLAND.
Master of the Belvoir Hounds.

—o—

From the Earl of Harrington.
January 9th, 1889.

SIRS,—Elliman's Royal Embrocation is used in my stables, and I consider it the best that I can obtain. HARRINGTON.
Master of the South Wilts Hounds.

—o—

From Major M. J. Balfe,
South Park.
June 16th, 1892.

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M. J. BALFE.
Master of the Roscommon County Staghounds.

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From Lord Haddington, Tyningham, Prestonkirk, N.B.
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HADDINGTON.
Master of the Berwickshire Hounds

—o—

From R. Burdon Sanderson, Esq., Warren House, Belford
July 10th, 1892.

SIRS,—Elliman's Royal Embrocation is used in my stables, and I consider it very useful.

R. BURDON SANDERSON.
Master of Percy Foxhounds.

—o—

From Wm. J. Buckley, Esq., Penyfai, Llanelly.
July 16th, 1892.

DEAR SIRS,—I have much pleasure in recommending your Royal Embrocation. I always keep a stock in my stables and kennels. My farm bailiff has also found it of much value among my herd.

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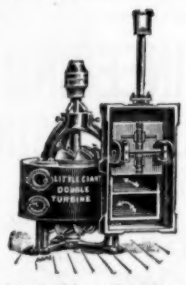

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Subscription £1 4s. per annum; including postage to Great Britain £1 15s. per annum.

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Mining men and others in all parts of the world, who wish to secure the most complete budget of Australian news, and particularly of Mining Intelligence, will do well to have THE ADELAIDE OBSERVER regularly posted to them.

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Advertisements received by all the principal London Agents or at the London address, given above.

EL MINERO MEXICANO.

The Mining and Industrial Journal of Mexico,

ESTABLISHED 1873.

Published in the City of Mexico every THURSDAY in the Spanish Language.

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RICHARD E. CHISM, M.E., Editor and Proprietor.

THE STAFFORDSHIRE ADVERTISER.

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The Principal County Paper in the Midlands.

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ALUMINIUM.

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NEW PATENTS.

LIST of APPLICATIONS for New Patents relating to Mining Metallurgical, Engineering, Railway and kindred matters, specially compiled from official sources for the "Mining Journal" by Messrs. Rayner and Company, Patent Agents, 37, Chancery Lane, London, W.C., who will forward all information regarding them free on application.

8924 Joshua Robert Alderdice, 61, Upper Arthur Street, Belfast.—An arrangement of mechanism for increasing rotary power.—May 6.

8929 Matthew Paul, 87, St. Vincent Street, Glasgow.—Improvements in steam engines.—May 6.

8936 William Arthur Pughe, Nottingham Road, Codnor, Derbyshire.—A double-acting detaching or disengaging hook to prevent over-winding in mines.—May 6.

8943 Thomas McCarter and Thomas Cooper, 55, Chancery Lane, London.—Improvements in motors.—May 6.

9010 George Edward Baird, 5, John Dalton Street, Manchester.—Improvements in electric railways.—May 7.

9038 Alfred George Melhuish, 203, Choumert Road, Peckham, London.—Improvements in and connected with internal combustion engines.—May 7.

9053 John Cope Butterfield, 323, High Holborn, London.—Improvements in the treatment of bluestone and sulphuriscd ores.—May 7.

9057 Oliver Imray, 28, Southampton Buildings, Chancery Lane, London.—An improvement in steam diaphragm pumps.—May 7.

9067 Reginald Walter Parker, Monument Chambers, King William Street, London.—Improvements in safety valves.—May 7.

9068 Elizabeth Barnston Parnell, 15, St. Michael's Road, Wallington, Surrey.—Improvements in the extraction of metals from their ores.—May 7.

9072 Emil Ernst Langwitz, 115, Cannon Street, London.—New or improved process and apparatus for reducing or smelting ores.—May 7.

9073 William Arthur Thoms and Joseph Stevenson, 46, Queen Victoria Street, London.—An improvement in alloys.—May 7.

9076 Arthur George Evans, 70, Palace Chambers, Westminister.—Improvements in pulley carriers for use in railway signalling.—May 7.

9151 Marie Edmund Philbert Charbocbe, 323, High Holborn, London.—Improvements in or relating to rotary engines.—May 8.

9159 William Robert Sykes, jun., and John Patrick O Donnell, 70, Palace Chambers, Westminster.—Improvements in lock and block signalling on railways.—May 8.

9162 Edward Bennis, 6, Lord Street, Liverpool.—Improvements in or appertaining to steam boilers.—May 8.

9173 Alfred Lindsay Forster, 46, Lincoln's Inn Fields, London.—Improvements in steam engines.—May 8.

SPECIFICATIONS PUBLISHED.

7693, Butter, steam &c., engines, 1894; 7794, Herald, steam boilers, 1894; 9,007, Johnson, steam generators, 1894; 11,578, Harff, steam generators, 1894; 11,818, Dutton, metallic posts for railways, 1894; 12,587, Ashworth and others, ventilating railway carriages, 1894; 113, Coates and Landells, railway signal apparatus, 1895; 114, Landells and Coates, railway signal arms, 1895; 5405, Langen, overhead railways, 1895.

The above specifications published may be had of Messrs. Rayner and Co., 37, Chancery Lane, London, at 10d. each, including postage.

JOINT-STOCK COMPANIES.

NEW REGISTRATIONS.

THE following are among the joint-stock companies registered at Somerset House since our last notice:—

Cape Investment Syndicate (Limited).—Registered by M. Abrahams, Sons, and Co., 8, Old Jewry, E.C., with a capital of £10,000 in £1 shares (200 founders'). Object: To acquire, develop, turn to account, and generally deal with any gold, silver, coal, lead, tin, or other mines in South Africa, or elsewhere. The directors are to be elected by the signatories. Neither qualification nor remuneration stated.

Gold Fields of New Zealand (Limited).—Registered by Sanderson and Co., 46, Queen Victoria Street, E.C., with a capital of £100,000 in £1 shares. Object: To acquire and deal in stocks and shares, debentures, &c., of any companies, mines, &c., in New Zealand or elsewhere. The directors are to be elected by the signatories. Qualification £500. Remuneration, £100 each and a percentage of the profits, divisible.

Mallina Consols (Limited).—Registered by Jordan and Sons, 120, Chancery Lane, W.C., with a capital of £160,000 in 10s. shares. Object: To adopt and carry into effect an undetailed agreement for the acquisition of certain mines, mining and water rights, grants, claims, leases, concessions, &c., in Western Australia; to develop and turn to account the same, and to carry on the business of a mining, milling, smelting, and metallurgical company in all or any of its branches.

Tyne Coal Cutter (Limited).—Registered by Dix and Walow, 18, Serjeants' Inn, Fleet Street, E.C., with a capital of £5000 in £10 shares. Object: To enter into a certain agreement for the acquisition of certain patents, patent rights, &c., relating to improvements in coal cutting, &c., machinery, and to develop and turn to account the same. The directors are to be elected by the signatories. Registered office, High Bridge Works, Newcastle-on-Tyne.

North-West Australian Gold Fields (Limited).—Registered by Sutton and Co., 3 and 4, Great Winchester Street, E.C., with a capital of £250,000 in £1 shares. Object: To adopt and carry into effect an agreement, made April 25, between G. Hill of the one part, and W. Milligan, on behalf of this company, of the other part, and generally to acquire by purchase or otherwise, work, develop, and turn to account any mines, mining and water rights, claims, leases, grants, concessions, mineral properties, &c., in the colony of Western Australia, and to carry on the business of a mining and smelting and metallurgical company in all branches.

Durban Gold Mines (Limited).—Registered by Templer, Down, and Miller, 3, Pope's Head Alley, Lombard Street, E.C., with a capital of £120,000 in £1 shares. Object: To adopt and carry into effect an agreement expressed to be made between R. Clement of the one part, and this company of the other part, and generally to acquire, by purchase or otherwise, mines, mining, water, and other rights, grants, leases, claims, concessions, &c., and to carry on the business of a mining, milling, smelting, and met-lurgical company in all its branches; as colliery proprietors, quarry and oil well owners, &c.

North Charterland Exploration Company (Limited).—Registered by Renshaw and Co., Suffolk Lane, E.C., with a capital of £1,000,000 in £1 shares. Object: To acquire a concession for mining and land rights in Africa, granted, or to be granted, by the British South Africa Company; to prospect, explore, work, and generally turn to account any mines, mining, and other rights, grants, claims, leases, concessions, &c.

Mines Acquisition and Development Company (Limited).—Registered by Lucas and Ward, 6, Eldon Street, E.C., with a capital of £50,000 in 5s. shares. Object: To carry on in all its branches the business of a financial agency, and also to acquire, develop, work, and generally turn to account, in such manner as the company shall see fit, gold, silver, copper, manganese, iron, lead, coal, or other mines, and to carry on business as miners and smelters, metallurgists, &c.

CONTRACTS OPEN:

FOR MINE, QUARRY, RAILWAY, AND ENGINEERING WORK, STORES, &c.

**** We shall be obliged by being promptly placed in possession of particulars regarding contracts open for competition, and of the results of successful tenders. In the latter case contract prices should be given.*

The date given is that by which tenders must be delivered, in nearly all cases further information can be obtained on application at the addresses given. In applying for such the name of "The Mining Journal" should be mentioned as the original source of the information, concerning which further particulars are required.

HOME CONTRACTS.

Boiler Construction, June 1 (*Dover*).—For the construction and delivery at their Buckland Works of two Lancashire boilers, for the Dover Gaslight Company. Drawing and specifications can be seen at the office of Mr. T. N. Kirkham, 335, Mansion House Chambers, London, E.C.

Coal, June 4 (*Carmarthen*).—For supply of about 2000 tons best well-screened large gas coal, to be delivered in trucks at Carmarthen Station between July, 1895, and June 30, 1896, in such quantities as may from time to time be required, for the Carmarthen Gas Company. Mr. B. A. Lewis, manager and secretary, Gasworks, Carmarthen.

Coal, June 6 (*Cheltenham*).—For the supply of gas coal for 12 months from August 1, for the Cheltenham Gaslight and Coke Company. Full particulars may be obtained from Mr. R. O. Paterson, engineer and manager, Gasworks, Cheltenham, to whom tenders must be delivered by June 8.

Reservoir, June 10 (*Holyhead*).—For the construction of an open reservoir of about 1¼ acres in extent, with filters, for the Holyhead Waterworks Company. Plans and specifications may be seen at the office of the Company, 17, Stanley Street, Holyhead.

Earthwork, July 23 (*Cairo*).—Tenders will be received at the Secretariat of the Egyptian Railway Administration at Cairo up to July 23 at noon for earthwork, masonry, pitching, buildings, and other works for the line from Kafr-Zayat to Chabas. Payments are guaranteed, and will be made by the Commission of the Public Debt, Egypt. Conditions, general and technical, and description of works, may be seen during office hours on application to Lieutenant-Colonel Western, Broadway Chambers, Westminster, S.W.

Houses (*Whitburn Colliery*).—For building 42 houses, including the construction of streets and drains, at Whitburn Colliery. Plans and specifications can be seen on application to the Harton Coal Company (Limited), General Offices, Harton Colliery, South Shields.

Sinking Pit (*Blantyre, Scotland*).—For sinking new pit at Whistleberry Colliery, Blantyre. Full particulars on application at Greenfield Colliery Office, Hamilton

THE EFFECT OF ARSENIC ON STEEL.

By JOHN EDWARD STEAD, F.I.C.

(*Continued from page 586.*)

MANY of the samples of steel made at Eston have been check-tested, both chemically and mechanically, by my friend Mr. F. W. Harbord, in conjunction with Mr. Philip Reilly, of the Royal Indian Engineering College, and it is with great satisfaction that I have to acknowledge their results.

It was unfortunate that the testing apparatus at my disposal was not adapted for taking the elastic limit of the various steels, and I am, therefore, under great obligation to Mr. Harbord for having determined and obtained most excellent self-recorded diagrams from the instruments at Cooper's Hill, showing the elastic limit as well as the other properties of the steels he examined.

The results of our various trials I propose to record under the following heads:—

1. Acid Bessemer steel, with and without arsenic.
2. Acid open-hearth steel, with and without arsenic.
3. Basic Bessemer steel, with and without arsenic.
4. Crucible steel, with and without arsenic.
5. Alloys of iron and arsenic.

The tests recorded indicate—

A. The tensional strength of the steel and limit of elasticity.
B. The elongation when ruptured.
C. The contraction at the point of fracture.
D. The bending tests, with and across the grain, or direction in which the steel was rolled.
E. Welding tests.
F. The tenacity and resistance to torsion of several of the series when drawn down to wire.
G. Electric conductivity.
H. Resistance to corrosion.

Methods of Testing and Definitions.

The tests called temper tests consisted in bending the steel after heating to a good red heat and quenching in water at 85° Fahr.

Annealing was effected by heating the steel to a bright red heat and allowing it to cool down with the furnace.

The machine used for determining the tenacity, &c., was made by Buckton and Co. (50 ton single lever).

The welding tests were made by a good blacksmith on small strips of many of the samples.

The conductivity tests were made in my own laboratory, and are not absolute, but simply comparative. The wires of the same size from each series, with and without arsenic, were compared one against the other by aid of a simple form of Wheatstone bridge, the electric equilibrium being established by gradually shortening the wire, showing the greatest resistance until the needle of the galvanometer remained stationary at zero. The relative lengths of the two wires in the split current indicated inversely their resistance and directly their conductivity.

The corrosion tests were made on a very small scale, and for this purpose the same wires which were used for determining electric conductivity were carefully cleaned with rather coarse emery cloth, and equal weights and lengths of the arsenical and non-arsenical steels were subjected to the action of a corrosive liquid and to water. After a period of time the wires were removed from the liquids, and were carefully rubbed with a cloth, and were weighed, and the loss noted.

Such tests can only be considered as indicating the action of the various agents used on the bright scale-free surfaces of the steel, as they were not continued for a sufficient length of time to determine their corrosive value on the surfaces after they had been coated with a layer of rust. I have noticed that the action of ordinary water on bright steel surfaces is much more rapid at first than it is after a coating of rust has been formed on them.

Practical trials of extended duration with steel in positions where natural agents are at work still need to be carried out.

No. 1 Series.—Arsenic in Acid Bessemer Steel.

In the first ingot made, sufficient arsenic was added to the steel when in a fluid state to give 0·13 per cent. of arsenic. A small quantity volatilised, but about 0·11 per cent. was retained in the steel.

The analyses of the steel, treated and untreated, were as follows:—

Description.	Arsenical. Per cent.	Normal. Per cent.
Carbon	0·395	0·395
Manganese	0·864	0·864
Silicon	0·093	0·093
Sulphur	0·060	0·052
Phosphorus	0·066	0·068
Arsenic	0·127	0·016

Hot Working.

Both steels rolled equally well, and there was no indication of red-shortness.

They were made into flanged rails of 75 lbs. weight per yard.

Percussion Tests.

Two rails of each variety were tested separately by placing them on bearings 3 feet 6 inches apart, and a weight of 1 ton was allowed to fall on the heads of the rails from a height of 20 feet, and after the deflection was noted the weight was again drawn up to the same distance and was allowed to drop a second time.

All the rails stood this test without breaking.

The following are the deflections recorded, viz.:—

	0·11 Per cent. arsenical.	Normal.
First blow	$2\frac{1}{16}$-$2\frac{1}{8}$ deflection	$2\frac{3}{8}$-$2\frac{1}{2}$
Second blow	$4\frac{1}{8}$-$4\frac{3}{16}$ "	$4\frac{3}{8}$-$4\frac{1}{2}$

Judging from the deflections no difference is observable.

Several pieces of the rail were cut up and test-pieces turned from the head of each. The area of the portion tested was about 0·45 inch. Other pieces of the rails were annealed by placing them in a furnace heated to a good red heat. They were introduced at night, and allowed to cool down with the furnace. They were withdrawn next morning, and were then machined and tested. The object of annealing in this way was to eliminate differences which might exist by possible variations in the treatment of heating and rolling the rails.

The following were the results obtained:—

Unannealed Rail Heads.

ARSENICAL.

	1.	2.	Average.
Breaking weight in tons per square inch	43·7	42·0	42·85
Elongation in 2 inches	17·0	20·0	18·50
Contraction of area at the point of rupture	22·0	22·8	22·40

NORMAL.

	1.	2.	Average.
Breaking weight in tons per square inch	41·7	43·1	42·4
Elongation in 2 inches	19·0	16·0	17·5
Contraction of area at the point of rupture	24·6	28·0	23·8

Annealed Rail Heads.

ARSENICAL.

	1.	2.	Average.
Breaking weight in tons per square inch	40·6	38·5	39·55
Elongation in 2 inches	27·05	30·0	28·62
Contraction of area at the point of rupture	37·7	39·2	38·45

NORMAL.

	1.	2.
Breaking weight in tons per square inch	39·9	47·2
Elongation in 2 inches	30·0	19·5
Contraction of area at the point of rupture	41·0	25·5

It will be noticed that the second test of the annealed normal steel is widely different from the first. In order to determine the cause, each piece was tested for carbon, as it was expected that it might contain more of that element than the other, and it was found that there was in the abnormal test-piece 0·47 per cent. carbon, against 0·395 per cent. in the others. It is clear that the test of this high carbon material should be rejected, and the first sample be taken as being the true representative.

Placing the results corrected in this way side by side, we have, viz.:—

	Unannealed. Arsenical.	Unannealed. Normal.	Annealed. Arsenical.	Annealed. Normal.
Breaking weight in tons per square inch	42·85	42·40	39·55	39·9
Elongation in 2 inches	18·50	17·50	28·62	30·0
Contraction of area at point of rupture	22·40	23·80	38·45	41·0

The differences here shown are so slight that they are negligible. Practically they are identical.

Bend Tests.

Portions of the webs and flanges from the rails were bent cold, and after heating to a low blood red heat, they were quenched in water. One of the webs from the normal rail cracked, but all the arsenical pieces bent well without breaking.

The temper test-pieces were taken from the flanges, and both classes of steel bent well without breaking.

As the web referred to which cracked in bending contained a little more carbon than the other, it would account for its cracking.

No. 2 Series.

The second ingot made contained 0·14 per cent. of added arsenic. The aim was to add 0·15 per cent., but only 0·14 per cent. remained in the steel.

The treated and untreated ingots were rolled into bull-head rails of 82 lbs. weight per square yard.

CHEMICAL ANALYSIS.

Description.	Arsenical. Per Cent.	Normal. Per Cent.
Carbon	0·185	0·220
Manganese	0·374	0·403
Silicon	0·018	0·018
Sulphur	0·019	0·019
Phosphorus	0·055	0·054
Arsenic	0·158	0·018

It will be noticeable that the arsenical steel contains less carbon and manganese than the normal. This is probably accounted for on the supposition either—

1. That the steel in the main ladle had not been intimately mixed; or,
2. That a little oxidation was effected during the exposure of the charge containing arsenic by double teeming.

Hot Working.

Both steels rolled excellently, and absolutely no red-shortness could be detected in either.

Percussion Tests.

One portion of each rail was subjected to the weight of 1 ton falling from a height of 20 feet, with the following results:—

	Arsenical.	Normal.
Distance between bearings	3 ft. 6 in.	3 ft. 6 in.
First blow of 1 ton 20 feet—deflection	3 in.	$2\frac{3}{4}$ in.
Second blow of 1 ton 20 feet—deflection	$5\frac{3}{8}$ in.	$5\frac{1}{8}$ in.

Neither rail broke, but the deflections clearly show that the arsenical steel was softer than the other—a fact fully accounted for by its lower content of carbon and manganese.

Tenacity, &c.

Pieces cut from the rails were treated and examined by Messrs. Harbord and Reilly in the same way as those of No. 1 Series.

Tests made at Eston.—Rail Heads not Annealed.

ARSENICAL.

	1.	2.	Average.
Breaking weight in tons per square inch	29·70	30·20	29·95
Elongation in 2 inches	32·00	34·00	33·00
Contraction of area at the point of rupture	48·7	53·30	51·00

NORMAL.

	1.	2.	Average.
Breaking weight in tons per square inch	33·40	33·70	33·55
Elongation in 2 inches	33·00	33·00	33·00
Contraction of area at the point of rupture	46·70	47·70	47·20

Rail Heads Annealed.

ARSENICAL.

	1.	2.	Average.
Breaking weight in tons per square inch	31·00	30·00	30·5
Elongation in 2 inches	33·00	36·00	34·5
Contraction of area at the point of rupture	52·30	57·50	54·9

NORMAL.

	1.	2.	Average.
Breaking weight in tons per square inch	33·40	33·00	33·20
Elongation in 2 inches	32·00	33·00	32·50
Contraction of area at the point of rupture	49·50	46·70	48·10

AVERAGES.

	Not Annealed. Arsenical.	Not Annealed. Normal.	Annealed. Arsenical.	Annealed. Normal.
Breaking weight in tons per square inch	29·95	33·55	30·5	33·2
Elongation in 2 inches	33·00	33·00	34·5	32·5
Contraction of area at the point of rupture	51·00	47·20	54·9	48·10

Taking into consideration the differences in carbon and manganese in two steels, we may, I think, safely assume that the greater softness of the arsenical material is due to that cause, and not to the presence of arsenic.

Although the results are not strictly comparable, I think we may assume that there is no evidence to prove that an addition of 0·14 per cent. arsenic to steel of the character used has deteriorated the quality.

Bend Tests.

The pieces used for these tests were taken from the webs of the rails, and they have all bent equally well without fracture.

No. 3 Series.

The third ingot made contained 0·17 per cent. of added arsenic.

The ingot of arsenical steel was rolled into flanged rails of 60 lbs. to the yard.

The normal ingots were rolled into double-headed rails of 69 lbs. to the yard.

CHEMICAL ANALYSIS.

Description.	Arsenical. Per cent.	Normal. Per cent.
Carbon	0·320	0·315
Manganese	0·662	0·756
Silicon	0·028	0·028
Sulphur	0·042	0·063
Phosphorus	0·057	0·058
Arsenic	0·242	0·073

Hot Working.

No indication of red-shortness was observable in either steel.

Percussion Tests.

The following are the results of the falling-weight tests. For the light section the weight was dropped 16 feet; for the other, 20 feet.

	Arsenical.	Normal.
Weight per yard	60 lbs.	69 lbs.
Distance between heaving	3 ft. 6 in.	3 ft. 6 in.
1st blow	$3\frac{1}{4}$ in.	$2\frac{7}{8}$ in.
2nd blow	$5\frac{1}{16}$ in.	$5\frac{1}{4}$ in.

Tenacity, &c.

The results of Messrs. Harbord and Reilly's tests are shown in the accompanying diagram.

Tested at Eston—Rail Heads not Annealed.

ARSENICAL.

	1.	2.	Average.
Breaking weight in tons per square inch	34·9	35·2	35·05
Elongation in 2 inches	25·0	30·0	27·50
Contraction of area at the point of rupture	42·7*	51·4	47·05

* This was badly clipped and broke at the back.

NORMAL.

	1.	2.	Average.
Breaking weight in tons per square inch	34·6	34·0	34·30
Elongation in 2 inches	28·0	25·5	26·75
Contraction of area at the point of rupture	50·5	51·2	50·85

Rail Heads Annealed.

ARSENICAL.

	1.	2.	Average.
Breaking weight in tons per square inch	36·0	35·2	35·6
Elongation in 2 inches	28·0	25·5	26·75
Contraction of area at the point of rupture	42·3	51·4	46·85

NORMAL.

	1.	2.	Average.
Breaking weight in tons per square inch	35·2	37·0	36·1
Elongation in 2 inches	28·0	25·5	26·75
Contraction of area at the point of rupture	45·5	42·1	43·80

Webs of Rails Annealed.

ARSENICAL.

	1.	2.	Average.
Breaking weight in tons per square inch	31·9	32·2	32·5
Elongation in 8 inches	18·0	21·0	19·5
Elongation in 10 inches	17·0	20·0	18·5
Contraction in area at the point of rupture	44·7	38·4	41·55

NORMAL.

	1.	2.	Average.
Breaking weight in tons per square inch	32·4	32·7	32·55
Elongation in 8 inches	21·0	18·0	19·25
Elongation in 10 inches	19·0	16·0	17·5
Contraction in area at the point of rupture	44·5	42·1	43·3

Judging from the average results, it would not appear that 0·17 per cent. of added arsenic has produced any material effect.

Annealing in this case does not appear to have increased the ductility of the material.

Bend Tests.

The arsenical pieces of this cast, both natural and tempered, bent without breaking, and were quite satisfactory.

The temper tests of the normal rail broke; the natural steel bent satisfactorily.

No. 4 Series.—Acid Open-Hearth Steel.

Unfortunately all the ingots which were not treated with arsenic in this experiment were rolled and sent away before it was discovered that one of them had not been preserved for testing with the arsenical ingot. I can, therefore, only give the results of testing the arsenical steel.

CHEMICAL ANALYSIS.

	Per cent.
Carbon	0·185
Manganese	0·345
Silicon	0·032
Sulphur	0·036
Phosphorus	0·068
Arsenic	0·136

The steel was rolled into $\frac{1}{4}$ inch, $\frac{1}{2}$ inch, $\frac{3}{4}$ inch, and 1 inch plates, and these were subjected to the usual tests, with the following results:—

TENSILE TESTS OF PLATES CONTAINING 0·136 per CENT. ARSENIC.

Description	Dimensions. Breadth.	Thickness.	Area.	Ultimate Stress. Total Tons.	Tons per Sq In.	Elongation in Inches. 8" × 1·"	Dimensions of Fracture. Breadth.	Thickness.	Area.	Contraction of Area per Cent.
						Per Cnt.				
With grain	1·48	0·26	0·375	12·4	33·1	17·5—16	1·28	0·12	0·151	59·7
Across grain	...	0·26	0·375	12·4	33·1	15 —13	1·30	0·19	0·247	34·2
With grain	1·49	0·49	0·730	20·5	28·1	29 —26	1·07	0·275	0·294	59·7
Across grain	...	0·49	0·730	20·0	27·4	23 —20	1·21	0·375	0·453	37·9
With grain	1·5	0·715	1·072	30·2	28·2	32 —29	1·06	0·46	0·487	54·5
Across grain	...	0·715	1·072	29·9	27·9	27 —25	1.17	0·55	0·643	40·0
With grain	1·49	1·0	1·490	42·1	29·0	34 —24	1·14	0·75	0·798	46·3
Across grain	1·5	1·0	1·50	40·6	27·0	10 — 9	1·42	0·93	1·280	14·3

Bend Tests.

These were all satisfactory. In consequence of the inability to make a proper comparison, a second trial was made with the same class of material.

(*To be continued*).

The directors of the WAIHI GOLD MINING COMPANY (LIMITED) have declared a dividend at the rate of 2s. per share, payable on the 11th June, free of income tax. The transfer books will be closed from the 4th to the 11th June inclusive.

APPENDIX 2 TO THIRD REPORT TO THE ALLOYS RESEARCH COMMITTEE.*

THE PYROMETRIC EXAMINATION OF THE ALLOYS OF COPPER AND TIN.

By ALFRED STANSFIELD, A.R.S.M.

THE experiments here recorded were made in the Research Laboratory of the Mint, with a view to obtain, by means of Professor Roberts-Austen's autographic recording pyrometer, curves which should represent the cooling of a series of alloys of copper and tin. As in other photographic curves which have been published in these Reports, the ordinates give the temperature of the alloy, which is cooling in a crucible, and the abscissæ represent the time occupied in its cooling. A selection from the numerous curves taken will show the nature of the results obtained.

Autographic Cooling Curves.

It will be noticed that at certain points the curves in Fig. 24 become less steep or even horizontal for a short distance, and then resume their original directions. This change is caused by the evolution of the latent heat of fusion in the alloy; and is not due, as it sometimes is in the cooling of metallic masses, to molecular changes occurring in the solid. The alloys were placed in a thick crucible, made by luting a small clay crucible inside a larger one of graphite, as shown eight times full size in Fig. 23. The lid fitted loosely within the outer crucible; and a clay tube, having its lower end closed, passed through a hole in the lid. The wires forming the thermo-couple passed down the tube, being insulated by slips of mica, and were fused together at the bottom. The two metals to form the alloy were melted together, and were covered with powdered electric light carbon, which proved very effective in preventing loss by oxidation. When the alloy was thoroughly liquid, the crucible was removed from the fire; and the lid, tube, and thermo-couple, all of which had been previously heated, were placed in position. The recording apparatus was then started, and the curve of cooling traced autographically.

These photographic curves were calibrated by reference to similar curves which showed the freezing points of gold, aluminium, lead, and tin; the respective melting points being taken as 1045°, 625°, 326°, and 227° C.; or 1913°, 1157°, 618°, and 441° Fahr. The boiling points of water—100° C. or 212° Fahr., and of sulphur 448° C. or 838° Fahr.—were also used in calibration. In Fig. 24 the cooling curves for the series of alloys have been plotted with time and temperature as co-ordinates; and they are so arranged that the point at which each curve intersects the horizontal "composition" line PP marks the percentage of copper in the alloy represented by the curve.

Freezing Points.

Beginning at the copper end of the series, it will be seen that pure copper has a single fairly sharp freezing point; the temperature of the metal falls only slightly during solidification. As successive additions of tin are made, the freezing point of the alloy is lowered; and the part of the curve which represents the freezing of the mass becomes steeper, and more rounded at the lower end.

In the cooling of the alloy containing 90 per cent. of copper, it appears that, while the alloy as a whole freezes at 1000° C. or 1830° Fahr., a small portion remains liquid until 770° C. or 1420° Fahr. is reached. Alloys containing about 80 per cent. of copper solidify in three distinct stages; and those containing from 50 to 25 per cent. of copper have no fewer than four separate freezing points.

The respective groups of tin and copper atoms which fall out of solution are not merely rejected by the portions of the alloy which freeze first. The constitution of a solidified alloy of copper and tin may, therefore, depend on the temperature to which the molten alloy has been raised, and on the time during which it has been in the molten state. An alloy of copper and tin, which had been maintained molten for nearly a week, showed on analysis metallic crystals of a copper-tin compound, which were insoluble in nitric acid; although all the known alloys of copper and tin are readily soluble in nitric acid. Similar crystals, but in much smaller quantities, were found in alloys which had not been so long melted. This compound of difficult solubility appears to form slowly, like certain other chemical compounds.

Other Physical Properties.

In Fig. 25 the lines *aa* to *ff*, which connect the freezing points of the several alloys, have been plotted with temperature and percentage of copper as co-ordinates, thus showing at a glance the number and respective temperatures of the freezing points of an alloy which contains any given percentage of copper. Curves representing various other physical properties of the copper-tin series are plotted for comparison.

The sudden fall which is produced in the electrical conductivity of copper, by the first addition of tin, has been given as evidence of molecular change. The sharpness of the freezing point of copper is also destroyed by slight additions of tin; and surfusion—that is, the property of cooling below the freezing point before actually becoming solid—which appears to be a test of the purity of copper, has been observed only in a sample of particularly pure electrotype copper. Tin, on the other hand shows surfusion even when alloyed with 5 per cent. of copper.

The first appearance of a second freezing point occurs in the alloy which contains 90 per cent. of copper. The first great break in the electrical conductivity curve also occurs in an alloy which contains 91 per cent. of copper. The alloy $SnCu_4$ freezes almost entirely at 750° C. or 1330° Fahr.; and the group of copper and tin which in the 90 per cent. copper alloy freezes at 760° C. or 1400° Fahr., will probably contain nearly the same percentage of copper as $SnCu_4$. Now $SnCu_4$ has the worst conductivity of the whole series; so that the low conductivity of the alloys which contain from 70 to 90 per cent. of copper is evidently due to the presence in these alloys of the particular group of copper and tin which freezes at 760° C. or 1400° Fahr.

Tensile Strength and Elongation.

In Fig. 26 are plotted curves showing the ultimate tensile strength and elongation of the alloys of the copper-tin series, together with the foregoing lines *aa* to *ff* joining the freezing points of the several alloys; these mechanical tests are taken from Thurston's report on the copper-tin series. The results of mechanical tests are, in themselves, complicated; tensile elongation, for instance, appears to require a certain degree of hardness; and the increase of extensibility which follows the addition of a small quantity of tin to copper, or of copper to tin, may be the result of an increase of hardness. On the other hand, the sudden decrease of extensibility which follows further additions of copper to tin, or of tin to copper, and the peculiar hollow which in the curve of tensile strength characterises the alloys containing about 90 per cent. of copper, occur almost simultaneously with the appearance of double freezing points. An alloy composed of two or more groups of metals, which have different freezing points, and are mechanically mixed with each other, is less likely to be ductile than one in which the metals are homogeneously united; and the groups of tin and copper atoms which fall out of solution are probably of a brittle nature. The fractures of the specimens may be noticed in connection with their mechanical properties. The great decrease in the strength of the copper tin alloys, which takes place when the amount of tin is increased beyond about 20 per cent., is connected with a change in their crystalline character, which ceases to be finely granular, and becomes vitreous. The group, or compound of tin and copper which produces this vitreous character, has its freezing point at 760° C. or 1400° Fahr. on the line *bb*, and forms nearly the whole of the alloy $SnCu_3$ so that this group would appear to contain about 70 per cent. of copper. It is probably this group which produces the remarkably sharp initial freezing point of the alloy containing 65 per cent. of copper, and the surfusion and the sharpness of this freezing point are quite exceptional in alloys of the copper tin series. The crystalline fracture of the alloy $SnCu_3$ is quite different from the vitreous fracture of $SnCu_4$; and this difference is evidently connected with the change in the group of tin and copper which forms the more fusible constituent of these alloys. In the alloy $SnCu_4$ the more fusible constituent freezes at 570° C. or 1060° Fahr., and is present only in small quantity; while in $SnCu_3$ it freezes at 650° C. or 1200° Fahr., and forms about one-third of the whole mass. The group which freezes first in $SnCu_4$ is also modified in $SnCu_3$ by the presence of an excess of tin. Among all the alloys of the series which have more than 10 per cent. of each metal, $SnCu_3$ is peculiar in having its two freezing points nearly united; thus accounting for the slight evidence of liquation—that is, separation of its more fusible constituents—which can be detected in it. $SnCu_2$, which also shows scarcely any liquation, has its freezing points more widely separated; but in this alloy the more fusible constituent is present only in small quantity.

Colour.

The colour of copper is rapidly destroyed by the addition of tin; only those alloys which contain more than 70 per cent. of copper have any of the copper colour left. Now all these alloys which retain the copper colour have an initial freezing point above the line *bb*, Fig. 24. The constituent of each of these alloys which produces the initial freezing point is copper dissolved in tin; the copper, not having combined chemically with the tin, but being in a state of solution in the liquid tin, retains a certain amount of its original colour. The least fusible constituent of each of the alloys that contain from 20 to 70 per cent. of copper may be regarded as being the group which in other members of the series freezes at 760° C. or 1400° Fahr.; and in these alloys this group is diluted with a varying amount of tin. The blue tinge of colour, which is seen in the alloys containing from 52 to 62 per cent. of copper, appears to be due to the presence of the group whose freezing point lies on the line *dd*, Fig. 24. In alloys containing more tin, this group is less developed, and no blue colour is visible. The alloys which contain from 20 to 40 per cent. of copper are composed of white platy semi-flexible crystals, and show segregation of a yellow compound. Still further additions of tin produce grey alloys containing small crystals, which disappear as pure tin is approached.

In this way, by considering the various physical properties and the crystalline form and colour of members of the copper-tin series, in connection with the cooling curves of these alloys, it is possible to obtain a general knowledge of the nature of the several groups of tin and copper, of which each alloy is composed. In order to obtain further information about these groups, it would be necessary to separate them; either by liquation, in the same way that Dr. Guthrie separated his eutectic alloys, straining off the more fusible constituent from a mass in which the less fusible constituents had crystallised out; or else by separating the groups in the solidified alloy, by chemical or electro-chemical methods. As an example of the latter mode of procedure may be noted Professor Laurie's experiments on the electromotive force of the copper-tin alloys. He found that by using an alloy containing rather less than 60 per cent. of copper as one pole of a voltaic cell which contained stannous chloride, the other pole being copper coated with cuprous chloride, tin was removed from the alloy until its composition approximated to 60 per cent. of copper. In this case it would appear that what was removed was not pure tin, but one or both of the groups, containg a large percentage of tin, whose freezing points are on the lines *ee* and *ff*.

Practical Applications.

The present research is of considerable interest in regard to the industrial use of the various copper-tin alloys, such as gun-metal, bell-metal, speculum metal, and bronzes in general. It has been stated in works on the alloys of copper and tin that the most fusible constituent of gun-metal melts at 500° C. or 930° Fahr.; and the line *ee* is found to lie at 500° C. or 930° Fahr., thus agree with previous observations. By simply taking a cooling curve from a small sample of any alloy, a manufacturer will be able to obtain much useful information about it. He can see at a glance its mode of aggregation, on which, as has been shown, its physical properties so largely depend. He can ascertain its degree of fusibility, which affects its value as a material for casting. He will be able to measure the temperature at which its most fusible constituent freezes, which not only indicates the mechanical properties of the alloy when cold, but also practically determines to what temperature it may be heated without serious loss of strength.

Annealing.

The temperatures at which the several constitutents freeze will indicate the method which must be employed to anneal the alloy. Alloys like the bronzes, which have a fusible constituent freezing at a temperature considerably below that at which the main part of the alloy solidifies, are annealed (not hardened) by heating to a red heat and chilling. The more fusible part of the alloy is thus melted, and made to solidify quickly, causing fineness of grain. The influence, however, of rapid or slow cooling varies in the several members of the series. In taking the cooling curves in the present experiments, the alloys were cooled to the freezing point of tin in about 45 minutes, the weight of each sample being 4 ounces. When cooled in this manner, the alloy SnCu, solidified in large shining crystals; when, however, it is cast in small iron ingot-moulds, it becomes minutely crystalline, and has a decidedly blue colour. Speculum metal $SnCu_4$ freezes almost entirely at its higher melting point, and is nearly unaffected by slow or rapid cooling. Consequently in practice, while gongs and most articles of bronze are tempered by being heated to redness and cooled quickly, speculum mirrors for telescopes are cooled extremely slowly in order to anneal them.

Tenacity.

Important information as to the probable behaviour of alloys at high temperatures is also afforded; for although the temperature at which marked decrease in strength occurs is below the lowest freezing point of the alloy, it nevertheless appears to have some connection with it. Thus copper containing 0·1 per cent. of bismuth, which would have a freezing point at about 268° C. or 514° Fahr., has at 160° C. or 320° Fahr. only one-third of the tenacity which it possessed at 15° C. or 59° Fahr.; while gun-metal, which has its lowest freezing point at 500° or 930° Fahr., does not show any marked decrease in strength until 300° C. or 570° Fahr. is reached. Pure copper, or arsenical copper in which the freezing point is high, does not show any considerable loss of strength at these temperatures.

Summary.

1.—No alloy of copper and tin which contains more than 5 or 10 per cent. of either metal solidifies as a whole. In each member of the copper-tin series there are at least two constituents, or groups of tin and copper atoms, which freeze at different temperatures. It is unlikely, therefore, that any alloy of tin and copper, which has been produced by melting in the ordinary way, is itself a simple chemical compound, though it may contain definite compounds.

2.—There is evidence of the existence, in alloys of tin and copper, of four or five distinct groups of tin and copper atoms, three of which appear to be fairly definite in composition. These may be either chemical compounds, which are capable of dissolving to a certain extent in excess of tin or copper, or they may be particular cases of the solution of copper in tin. The groups are probably formed by the affinity of copper and tin when in the molten state; and, as they never occur singly, they would appear to be unstable, no one group of tin and copper being produced to the exclusion of all the others.

3.—The initial freezing point appears to represent, in the alloys containing more than 70 per cent. of copper, free copper containing dissolved tin; while in the alloys containing less than 70 per cent. of copper, the initial freezing point seems to represent an excess of tin dissolved, not in free copper, but in one of these special groups of tin and copper atoms.

4.—A comparison of the series of cooling curves with the physical and mechanical properties of the alloys, and with the appearances of their fractured surfaces, confirms the belief in the existence of these special groups; and indicates that the peculiar and sometimes sudden changes in the physical properties of alloys may be often explained by the appearance and disappearance of these groups.

* Paper read before the Institute of Mechanical Engineers.

VICTORIAN GOLD MINING.

By THOMAS CORNISH, M.A.I.M.E., Author of "Our Gold Supply," &c.

BALLARAT is a field on which so much might be said that, although interesting to those living there, strangers may not feel equally so much interested.

Continuing my description of the main belt of reefs along the schistose ranges from Ballarat to Buninyong, the old outcrops must have been bold and very rich. The disintegration in former ages that took place washed and hurled down the streams and rivulets from off the eastern and western slopes vast masses of quartz, schist, slates and sandstones that formed the rich gravel washes in the gutters that caused the great attraction to gold miners to seek their fortunes. On the eastern slopes of this range were discovered the Canadian, the Prince Regent, the Sailors, the New Chum, and other leads which junctioned with a main channel in the flat that ran northward. In these gullies and flats immense riches were found, including many nuggets, some of them large, but the gold generally of a coarse or shotty character. The gutters usually contained from 1 foot to 4 feet of paying gravel or wash-dirt. Then, again, in places would be found a false bottom above the Main channel, on which a second, and sometimes a third layer of gravel or drift had been deposited, and at times, where the upper washes met the schist on the slopes of the hillsides would be found very rich deposits.

The famous Eureka lead took its rise from a gully in the north-east portion of the amphitheatre, and, after trending south for about a mile, and picking up several tributaries, turned west until it junctioned with the Main channel and the Gravel Pits lead in the Gum Tree Flats, which also absorbed the Red Streak, Bakery Hill, and other leads from off the Black Hill.

The western slope of the great range threw off several rich tributaries, such as the Golden Point Lead, the Nightingale, the Malakoff, the Miner's Right, the Redan, the Woolshed, the Terrible, the Nuggetty, the White Horse, the Magpie, the Frenchman's, the Long Gully, the Cobbler's, the Black Lead, the Scotchman's, Paddy's, and others. These several leads all trended westerly until junctioning with the Main channel going south, when they lost their individuality.

It was at this time—1856-7—when the several leads were found to be trending under the high plateau at great depths that an agitation set in about the size, area, and shape of mining claims, as on the wide basaltic plateau there were no surface indications to guide the miner as to the most likely spot to sink a shaft with any degree of certainty of getting gold.

The Ballarat Mining Board, which had been just established, initiated two systems of mining laws—one based on common sense (the "Block claims") and the other on a chimerical idea, the "frontage system." By the former, quartz reefs and shallow alluvial ground and old ground workings, the claims had a defined area; but by the latter, the titles on all known alluvial leads or gutters were under the "frontage system." This system professed to give a title on paper to a claim on some lead or gutter which may have had no existence, in fact. The idea of securing a certain number of lineal feet along the course of a rich auriferous lead or gutter by merely registering the names for application in the surveyors' books, at first appeared a very easy method of making sure of a good claim; and it is not to be wondered at that applications for registration were numerous. And as the surveyors were paid by the feet, they were not likely to place restrictions on the applications for claims. Such a system may have answered very well for claims on creeks or streams on the surface, but proved utterly delusive for securing titles to claims on golden streams 200 to 500 feet under the surface, it being impossible to identify one lead from another, as Nature had not placed any distinguishing mark upon them.

When the law was passed there was a rush for registering titles, and the various leads running under the Ballarat and Sebastopol, or western plateau, were pegged off in every direction, the prevailing idea and hope was that these registered leads of gold would go out west, but they did not. Nature had settled the course of the leads by sending the Main channel south, picking up the tributaries on its way; thus the calculations and hopes of many miners, and the wisdom of the lawmakers were frustrated.

The Gravel Pits and Golden Point leads having merged into one, became known afterwards as the Golden Point Lead, and took a tortuous but southerly course, ultimately merging into junctions with the other smaller streams (of which it took precedence) as it went south. The consequence was that many of the prospective registrations of titles on imaginary leads, which had no existence in fact, were not only delusive, but valueless.

Some of the mining companies registered for titles on these leads that had no existence after merging into the older lead, or which could not be found, bottomed their shaft, or drove into some other lead of gold, which they religiously stuck to,

worked out, and, when allowed, pocketed the gold; nor could they be much blamed, as no one could tell to whom the ground really belonged. It was a sort of "No Man's Land," or a "Tom Tiddler's Ground," everybody claiming it, and no one able to prove a right in law, because no law could divine what unknown course the leads and gutters might take, and it was only until the ground was all, or nearly worked out that it became possible to define the area of claims, and to whom such areas belonged under the frontage system.

The ground was exceptionally rich, the titles uncertain, and costly litigation as a natural consequence followed, creating much jealousy and bitter feeling, alienating friendships, and leading to desperate fights under ground and above. The insecurity of tenure created a distrust in gold mining as an investment in the district, and a stigma on the industry wholly undeserved; it retarded the systematic development of the mines, it entailed an extravagant waste of money in law, and a useless expenditure of time and labour that might have been devoted to a more profitable purpose.

This was the result of the "frontage system." The amateur mining law makers, who were the authors of this delusive and impracticable measure, started with a blunder, and kept on blundering every time they tried to amend it. Having gained a little popularity on its introduction, they were afterwards reluctant to acknowledge the error by repealing the obnoxious law, until it had to be abolished by its own iniquity. I can but re-echo the words of denunciation I made against it at the earliest time, when its evils (to myself) were so apparent. I stated "that it was the most absurd and ridiculous measure, as a mining law, that ever emanated from the deliberations of any body of men who claimed to be practical miners." For several years I denounced the system through the Press at every opportunity, and challenged the authors or upholders of the system to show that it had any redeeming features, until the reform in mining law I had advocated was carried into effect. I have mentioned this matter to show the urgency that all mining laws should be of a simple, definite, and liberal character; that under no circumstances should there be any conflicting interests as regards title within the same area of ground held for mining claims. No matter what shape, size, or area of ground be granted as a mining claim, all minerals within the limits should belong to the owners.

CYANIDE PRACTICE.*

By ALFRED JAMES.

THIS paper deals with the following branches of modern cyanide practice:—The Preliminary Investigation of Samples, Plant, and Extraction.

Preliminary Investigation of Samples.

In testing works a sample is first examined, and if in the crushed state, panned, to ascertain the nature of its contents. Ores are usually ground to pass a 30 mesh sieve, and extraction tests are made at this fineness and compared with results obtained by finer grinding; tailings and concentrates are tested as received.

The usual practice is to take 1000 grains of the sample, and to agitate this over-night with 500 grains of 0·5 per cent. solution of cyanide in a 12 ounce corked bottle, secured to a revolving shaft. On the following morning the solution is filtered off, and the consumption of cyanide is ascertained by titrating a measured part of the solution with $\frac{N}{10}$ standard Ag NO$_3$ solution. The sample is then washed, the remaining filtrate and washings are evaporated with litharge, and the gold in solution thus determined. The treated sample, now termed the "residues," is also assayed.

If the cyanide consumption has been heavy—say, over 0·15 per cent. on the ore—1000 grains of the latter are tested for acidity by means of a dilute standard solution of caustic soda. Occasionally it is found that better results are obtained by roasting certain ores than by treating them in the raw state.

After a general idea of the behaviour of the sample has been gained by the "bottle test," percolation tests are made in glasses or barrels, according to the size of the sample employed. Before proceeding to erect a plant, these small tests should be confirmed by experiments on larger quantities (say) ½ to 3 tons. It must be borne in mind that the consumption of cyanide is invariably greater in test experiments than in practice. It has been found in New Zealand that in actual work only one-third as much was used as was indicated by laboratory tests, which experience has been borne out by treating tailings in South Africa. On the other hand, practical extractions are usually higher than those in the laboratory.

Plant.

This usually consists of percolators, reservoirs, and extractors, to which, if necessary, agitators are added, these latter being, however, very seldom used. Sufficient percolators must be provided to carry out the operations in accordance with the result of the preliminary investigations; thus, if it is found necessary to percolate and wash for two and a-half days, and filling and emptying takes half a day, each vat will receive a fresh charge every three days; and if a plant is required to treat 100 tons per day, it will need three 100 ton percolators, or six 50 ton ones, with, in each case, one additional for contingencies; or in practice four 100 ton, or seven 50 ton vats, as the case may be, the larger size being generally preferred.

Agitators are either cylinders with an upright shaft in the centre, to which blades are attached, or else revolving wooden barrels. The fact that all such apparatus consumes power is, however, much to its disadvantage, so that preference is very generally given to the percolation method.

Percolators are either brick and cement pits, steel vats coated with asphalte varnish (used in the United States), wooden vats, or rectangular wooden tanks. It is usual to allow 30 cubic feet of vat space per ton of ore contents, with an additional depth of 9 to 12 inches for filter space, &c. Rectangular tanks are made of 9 inch by 3 inch deals, tongued and grooved, and bolted together by ¾ inch bolts, and are well braced and strutted to keep them rigid. These tanks may be of any size between 11 by 9 by 3½ feet and 24 by 16 by 5 feet. Most of the earlier plants were constructed of this shape.

Circular vats are made of staves from 3 to 4 inches wide, well planed, and shaped truly to the radius of the vat. The bottoms are made of 12 inch by 3 inch planks, held together by ¾ inch bolts, the vats being hooped with ¾ inch to 1 inch round iron. Filters of various materials and construction have been used. Now cocoanut matting is generally used, laid on a framework of slats, and caulked in with a ring of rope, unless vacuum suction is employed, when cotton twill or canvas is preferred for the actual filter, which is protected by cocoanut matting and wooden slats above it. Discharging doors are provided in the sides or the bottom of the vat when the sides of the latter are over 4 feet high.

The reservoirs are constructed in precisely the same manner as the percolators, except that they have no doors and no filter bottoms. They should be of sufficient capacity to contain at one time all the solutions—strong and weak—in circulation in the works. As a rule, their capacity is one-third that of the tanks.

The extractors are long boxes, or troughs, containing trays on which the zinc shavings are laid, the solution being compelled to pass always upwards through the successive trays by means of baffle-boards. There are usually 10 zinc compartments, each compartment being designed to hold 1 cubic inch of zinc for every ton treated per month. Thus a 2000 ton per month plant would have extractors with compartments capable of holding about 2000 cubic inches of prepared zinc, equal to a space of about 15 inches wide, 15 inches deep, and 9 inches long (in the direction of the length of the extractor). The whole box should have a fall of 1 in 20. Of the 10 compartments, only six are usually filled with zinc. In each there is fitted a tray of wire gauze of about ¼ inch mesh; the lower part of each compartment is closed by a plug, protected by an iron launder carefully locked. An extractor for a 2000 ton plant would measure 12 feet long, 18 inches wide, and 2 feet 6 inches over all. There are usually three extractors to each plant.

In addition to the above, a plant usually contains vacuum apparatus, pumps, settling tanks, pipe lines, launders, a melting furnace and assay laboratory, a lathe for turning the zinc shavings, and a proper water supply.

Extraction.

The ore may be wet crushed in the stamps, or dry crushed in rolls or Grusonwork ball mills. When wet crushing is used, means must be employed to get the pulp into the percolator in a leachable condition—that is to say that slimes must be separated out by settling-pits, buddles, spitzkasten or spitzluten, the slimes being set aside for after-treatment. If necessary, an alkaline wash is then run in, and, either with or without an intermediate clean water wash, the "strong" cyanide solution is run on. This is usually 33 per cent. of the amount of the ore, and may contain 0·3 to 0·7 per cent. KCy. When this "strong" solution has been run through and the top of the charge appears to be dry, the "weak" solution, usually containing 0·05 to 0·15 per cent. is run on. Some years ago the addition of haloid salts of cyanogen was attempted, but it was found that with neither ores nor tailings was there any improvement in results whilst there was an increased consumption of cyanide.

After the "weak" solution has percolated, which is usually hastened by the application of vacuum suction, the charge is washed with water: the amount of such washing should be about one-third the weight of the charge, and these water washings should be run through a special extractor. The residues are then either sluiced out or discharged by hand.

Each solution is run by launders to its own extractor, and the contents of each, in both gold and cyanide, are regularly tested. The reactions in the extractor are very complex, and at the start do not proceed as well as later on, when regeneration of the cyanide takes place to a certain extent. Many of the reactions appear to be due to the formation of a galvanic couple between the zinc shavings and the precipitated gold. The consumption of zinc is about ½ lb. per ton of ore treated; in some cases it is claimed to be only 2 ounces. As a general rule the solutions leaving the extractor should assay less than ½ dwt. of gold per ton. Under favourable conditions, this has been reduced for all solutions to under 2 grains per ton in regular, steady work. These figures show that zinc precipitation is effective with extremely dilute solutions. Various other precipitants have been suggested, such as aluminium, zinc dust or fume, sodium amalgam, and electricity, but with the possible exception of the latter, none of these suggestions appear to have made any headway in practice.

In cleaning up the extractor, it is first washed out with clean water, then all the gold slimes are separated from the zinc by working through a 40 mesh sieve, the cleaned zinc being put back in the first trays. The gold slimes are collected in a bag of twill, well settled, and finally fused in plumbago crucibles with fluxes that are varied according to the condition of the slimes. The slags are crushed to recover the gold they contain. The melted base bullion may be improved by granulating, giving it a sweating roast in a muffle, and remelting, when it will be bright and ductile.

* Read before the Institution of Mining and Metallurgy, May 15.

TRANSVAAL PROSPECTING COMPANY.—An extraordinary general meeting of the Transvaal Prospecting Company (Limited), for the purpose of confirming the liquidation of the company in view of reconstruction, was held on Wednesday, at the Cannon-street Hotel.—Mr. G. F. TAVENOR presided, and formally proposed:—"That the company be wound-up voluntarily under Section 129, Sub-section 2, of the Companies Act, 1862, and that Frederick William Sellick, of 20, Bucklersbury, in the City of London, be, and he is hereby appointed liquidator for the purpose of such winding-up."—The motion was seconded by Mr. Von Buch, and carried unanimously.—The Chairman then moved:—"That the draft agreement submitted to this meeting, and expressed to be made between this company and its liquidator of the one part and the Gold Explorers (Limited) (being a new company intended to be registered under such name, or under such other title as the Registrar of Joint Stock Companies may approve, and with a Memorandum and Articles of Association which have been already prepared with the privity and approval of the directors of this company), be, and is hereby, approved and adopted, and that the said liquidator be, and he is hereby, authorised and directed to enter into an agreement with such new company (when incorporated) in the terms of the said draft, and to carry the same into effect."—Mr. Austin asked whether, if the reserved shares were issued, they would be offered, in the first instance, to the shareholders.—The Chairman said the shares held in reserve would number 110,000, and they could not be issued at under their par value of 5s. He did not think it would be wise to bind the liquidator or the new board in regard to them, but any shareholder who manifested a desire to increase his holding would be able to do so. There was every prospect of the future being very different to the past, and he hoped the shareholders would take up their interest in the new undertaking, and recoup themselves in the future.—The motion, having been seconded, was put, and agreed to.—The Chairman stated that the shareholders showed every disposition to support the scheme, as was evidenced by the large number of proxies received; but even in the event of their not subscribing there were other parties who would do so, and, therefore, there need be no apprehension of difficulty in allotting the shares.—A vote of thanks to the Chairman concluded the proceedings.

GOLCONDA GOLD MINES.—An extraordinary general meeting of the shareholders of the Golconda Gold Mines was held on Monday, at Winchester House, for the purpose of considering resolutions for increasing the capital of the company to £100,000, by the creation of 25,000 new shares of £1 each, and making certain alterations in the Articles of Association.—Mr. R. J. Price, M.P., who presided, in moving the adoption of the resolutions, said that the company had acquired, on very reasonable terms, some additional properties of value and promise, which required capital for their development. Shareholders had received from time to time reports as to the progress of affairs at the mines, and he was glad to be able to inform them that the last reports received were by far the most satisfactory. The purpose of the alterations to be made in the Articles of Association was to enable share warrants to be issued to bearer. These would not be issued, however, unless there were a distinct demand for them.—Mr. McCulloch seconded the resolutions, which after a brief discussion, were put, and carried unanimously.

PARIS LETTER.

[FROM OUR OWN CORRESPONDENT.]

The drop in Rand mining shares.—The manœuvres of foreign speculators.—Position of Westralian mines.—Coal mining in the Transvaal.—English coal in France.

THE South African mining share market has sustained a rude shock during the past week by the publication of the report of M. Aubert, the French Consul at Pretoria. It is not that the report is more pessimistic than others that have been sent home from time to time, but it has been cleverly exploited by the "bears," who found that their manœuvres were greatly facilitated by the heavy drop in quotations on the Stock Exchange. M. Aubert warns French investors against rushing too wildly into Rand gold mining speculation by pointing out that 2267 companies have been formed for the working of the auriferous deposits in the Transvaal and Swaziland, and that the amount of money sunk in these ventures has reached the enormous total of £101,883,092, from which he concludes that the gold mining industry is too over-capitalised to be a profitable source of investment. This lumping together of all the concerns—good, bad, and indifferent—that have been floated since the inception of the Transvaal gold mining industry, is so obviously inept that the caution is not taken at all seriously. The author of the report has not drawn any distinction between the good and the bad mines in this general condemnation, though he alludes further on to the remarkable development of gold mining that has been carried out on the Rand by a smaller number of companies working upon a larger and more economical scale. The number of stamp batteries has only increased from 2064 in 1892, to 2260 in 1894. But the new stamps are much heavier than the old, and crush about 4 tons of quartz a day, as against 2 tons or 2½ tons previously. The treatment of tailings is another matter insisted upon by M. Aubert, who states that the amount of gold extracted in this way in 1894 was 671,968 ounces—or much more than double that of the previous year. These facts certainly do not point to any inherent weakness in the Rand mining industry, and if the production continues to increase in this way—as it is bound to do—the shareholders will have little reason to complain. They have, indeed, so much confidence in the future of the leading Rand concerns that the shares very soon began to recover from the drop in values that took place all round, and since then Randfonteins, Ferreiras, Geldenhuis, and Kleinfonteins have steadily advanced. It is true that another drop has taken place, and that Buffelsdoorns and several other shares are several points below their late quotations, but it is not likely that this quietude will last for any length of time. The fact that New Primrose shares were readily taken up on their introduction is pretty good proof that the Kaffir market is healthy enough to make an early recovery extremely probable.

Paris investors object strongly to the English methods of speculation that have lately been insinuating themselves on the Bourse, and efforts are being made to protect the market from the evil consequences of foreign manœuvres. It is sought to accomplish this end by the formation of financial bodies that open offices for the purpose of giving information as to the various gold mining enterprises on the market, but as these concerns are themselves closely identified with many financial mining ventures it is not easy to see how their advice can be always disinterested. To a certain extent, however, it is obvious that while they deal only in those shares that afford solid promises of realising large dividends, the ordinary investor cannot do better than to follow their lead. Any proof of the remunerative character of these concerns is seen not only in the high rate at which their shares are quoted, but in the recent formation of several others, whose object it is to facilitate negotiations between London and Paris, and protect their clients against the manœuvres of the Stock Exchange. All this is, of course, merely another method of making a profit out of the prevailing craze in gold mining, and is the outcome of the firm intention of the public to take up Rand shares as an investment and not as a speculation. At the last meeting of the Banque Internationale de Paris it was stated that the Compagnie Française de Mines d'Or, that had been formed with the co-operation of the Exploration Company of London, was meeting with a great deal of favour at the hands of the public, and in order to extend the operations of this concern the capital has been increased to half a million sterling by the creation of 25,000 new shares, which have all been taken up by the Exploration Company.

It is significant that the temporary scare of the past week has not so much affected the Rand mines as those concerns in other parts of the world which for some little time have been attracting a fair share of public attraction. Yet it is evident that as an investment some of the United States' mines may be taken up with perfect confidence. The production at the De Lamar Mine is small and progressive, and the dividends paid are very satisfactory. The outlook for these properties is the more encouraging, as some of them have begun to treat their tailings by the cyanide process. In the neighbourhood of the Victor Gold Mining Company, in Colorado, a cyanide plant has just been laid down, and the company has thus been able to dispose of 10,000 tons of low grade ore at $30 a ton, which allows of a profit of 6s. a share. The Australian mines have suffered still more from the general dulness of the market, and Londonderrys and other shares have fallen several points. Nevertheless, holders are not in a hurry to get rid of their shares at the low prices now prevailing, and having purchased them on exceptionally favourable terms soon after the recent "slump," they prefer to keep them until a more propitious moment. There is, indeed, a general impression that the Londonderry Mine will prove to be sufficiently rich in gold to justify investors in holding on to their shares. At the same time, Australian shares as a whole, will not be dealt in to any extent until some definite proof of their dividend-paying capacity is forthcoming.

The coal mining and other industries that depend for their prosperity upon the development of gold mining on the Rand are presented to French investors in a very favourable light in the report of the French Consul at Pretoria, alluded to above. M. Aubert states that during the past year the Transvaal coal mining industry has undergone a considerable extension. Without counting the Middleburgh Colliery, which has only been worked upon a systematic scale since the opening of the Pretoria-Delagoa Railway, the output of coal in the Transvaal in 1894 was 751,337 tons, of which 284,432 tons were produced by the Transvaal Coal Trust, 135,169 tons by the Cassel Colliery, and 177,915 tons by the South African and Orange Free State Coal and Mining Association. The two first-named concerns, which supply the gold mining companies on the Rand, were able to pay dividends of 7½ per cent. and 10 per cent. respectively. These results are sufficiently good to warrant the attention which French investors are disposed to give to industrial undertakings in the Transvaal, and it is by no means improbable that a good deal of capital will soon be diverted into this channel.

The position occupied by English coal in the west of France may be judged by the figures just issued of the imports of fuel into Bordeaux during the past year. The quantity of English coal unladen in that port in 1894 was 391,540 tons, which is a decline of 8000 tons upon 1893, and of 35,000 tons as compared with 1892. Of this total, 17,000 tons were purchased by the Midi and Orleans railway companies, whereas in the previous year the amount taken was 63,000 tons. It is evident, therefore, that the French colliery proprietors have succeeded, to some extent, in the war which they have been waging for some time past against the importation of foreign fuel. It is probable that in the present year they will not meet with so much success, as English coal is now being delivered at so low a price as to completely undersell the French fuel, in spite of the favourable terms for transport enjoyed by the native colliery-owners.

MEETINGS OF MINING COMPANIES.

PACCHA AND JAZPAMPA NITRATE COMPANY, LIMITED.

Additional nitrate grounds to be acquired.

THE annual ordinary general meeting of the Paccha and Jazpampa Nitrate Company (Limited) was held on Monday, at Winchester House, Colonel J. T. NORTH (the Chairman of the company) presiding.

The SECRETARY (Mr. John H. Gretton) read the notice convening the meeting.

The CHAIRMAN: Gentlemen—I have to propose the adoption of the directors' report and accounts for the year 1894, of which you have all had a copy. I may tell you that we have not done exactly as well in 1894 as we did in 1893. In 1893 we made £46,516, while in 1894 we made £43,950, or nearly £44,000. There is very little difference there, but there is another thing I want to draw your attention to—namely, that we are not giving you the same dividend this year. I may tell you that we gave you 12½ per cent. last year—a good dividend on those shares, which, I think, you can buy at about 3 now, though I do not know why that should be so. For 1894 we have paid you an interim dividend of 5 per cent., and we now recommend a further dividend at the rate of 4 per cent. If you look at the balance-sheet, you will see that last year we carried forward only £3400, and I hope you will agree with what we have done this time. We could have given you up to 12 per cent. again, but we have carried forward nearly £12,000, and I will tell you why. We are having questions about the combination. There is no doubt that we have been over-producing lately, and I, as Chairman of the Combination Committee, have done all that I possibly could; but there are two or three people here who insist on establishing a bad precedent by wanting more. The Rosario and Lautario have actually wanted more than they could produce I said I was quite willing to go into the combination on equal terms for everybody, but that I could not agree to the amount they required. I control about nine different works, which make about one-third of the whole nitrate, and if I did the same thing, what would be the result? In the first place we have the Iodine Combination, and the works I am connected with. Those people who have big stocks of iodine, I think, have made a mistake, but we have done well. We want to keep something in reserve, because I think we shall have two or three months' more fighting. The old nitrate works are stopping there now, because they cannot make a profit, so that I think you will agree with us that we are in good order in keeping this £12,000 back to meet any emergency. I may tell you that the price of nitrate went down in consequence of over-production, but I am pleased to see that it is going up, and I think we have a fair prospect for two or three months. I think they will have to come to an understanding if we are to have combination, and when we get that we are all right, and will make money. We are making money now, in fact, but not so much as we ought to make. My brother, who has come from the West Coast of South America, is the agent for this place, and no one knows more about it than he does. He has to go up to the nitrate works every week, and I am pleased to say that when he came back he reported that we had come across some very valuable grounds. We do not, however, want to work them out at a small profit when we can get a bigger one with the combination. I will now propose that the report and accounts be received and adopted. (Applause.)

Mr. J. J. SMITH seconded the resolution.

Mr. STRAUSS: Gentlemen—I am not a good speaker, and at all events I am not an English speaker—in fact, it is the first time in my life that I have ventured to address a meeting of English gentlemen in their own language. (Hear, hear.) I would certainly make an appeal to your courtesy if I ask for your kind indulgence. (Applause.) Well, sir, if you will kindly permit me, I would say a few words and ask a few questions about the balance-sheet. First of all, I do not find in the balance-sheet any depreciation account. I see that last year in the report there was stock of nitrate afloat, in Europe and in Chili, but you give us stock afloat and in Europe this year as £85,000 more than last year. There are people who do not know much of your business, and who will say that perhaps the board have held back, in view of a rise in the price of nitrate, a good many of the stocks, and I should like you to give me an answer to that. Then, I should like to ask you what influence the rate of exchange in Chili has got on the situation of the company. I may say, sir, that in Paris rumours have been afloat that the life of the mine would be a very short one. I have no doubt, after what you have said, and what Mr. Gamble North has said, you will take the opportunity of contradicting this, and I, therefore, wait for your kind answer. Another thing, and the last thing, is that I beg you, sir, to give instructions for next year that the report of the company may be printed in French, because French people to whom the report of the company may be sent, are not so conversant with the English language as they ought perhaps to be. I would also propose that reports of the company may be sent to the company in Paris acting as your agent, and that an advertisement should be published in the papers, so that everybody who is interested in the company as a shareholder may apply for a copy of the report. I would also propose that this report may be sent out a little earlier than it has been this year, because I may tell you that we only got one last Tuesday, and the advertisement to deposit shares did not appear in the papers until Friday morning. I, therefore, only represent about 5000 shares here; otherwise I should have represented, perhaps, 10,000 or 15,000 shares. As you know, the French people are very much interested in this concern. I have now to thank you very much for your kind attention. (Applause.)

Mr. BLUNDELL said he had no objection to the company carrying forward a large balance when a good and sufficient reason could be given for so doing, but that did not seem to be the case on the present occasion. It would have been more business-like, he considered, to have put aside a sum to a dividend-equalisation account, or something of the sort. If he was in order, he would be prepared to move a resolution to that effect.

The CHAIRMAN replied that if Mr. Blundell knew as much about the business as the board did, he would not object to the large balance being carried forward. Some of the nitrate made last year, and which was consigned, had not realised so much as was anticipated, and that had been provided for. With regard to Mr. Strauss' remarks, he would ask the board to give instructions that the report should be printed in French, as the French and Belgians had supported the company well. As to depreciation, the machinery was in better order than when it was put up, and money had been spent in renewing and extending it. It should also be remembered that the company possessed additional ground of considerable value, so that he did not believe the Jazpampa oficina was ever in such a good position as it was at the present time. Besides having these grounds, they had come across a discovery of very rich caliche. As to saying what the life of the mines might be, it was a difficult thing to give an exact opinion. He had not been there for some years, and his brother, who had lately come from the spot, would be able to give a better opinion than he could.

The report and accounts were unanimously adopted.

The CHAIRMAN next moved the re-election of the retiring directors—Mr. E. Spencer and Colonel G. W. A. Fitz-George.

Mr. SMITH seconded the resolution, and it was carried *nem. con.*

The auditors, Messrs. J. O. Chadwick and Son, were next reappointed.

On the motion of Mr. STRAUSS, a cordial vote of thanks was passed to the Chairman and directors.

Mr. GAMBLE NORTH, in reply to the question as to the life of Jazpampa, said that he went over the grounds with the present manager of the works, and spent three weeks there some little time ago. After the most careful calculation, they came to the conclusion that the oficina would have a life of from 15 to 20 years, at a production of 50,000 to 60,000 quintals per month (Applause.)

The CHAIRMAN replied to the vote of thanks, adding that since his brother went over the grounds they had acquired an additional 35 estacas. So that, instead of depreciation, they had now more property than they formerly owned. (Applause.)

The meeting then separated.

MAINLAND CONSOLS, LIMITED.

Satisfactory reports from the property.—Developments vigorously proceeding.

The statutory general meeting of the shareholders in the Mainland Consols (Limited) was held on Wednesday, at Winchester House, the chair being occupied by the Hon. HOWARD SPENSLEY.

The SECRETARY (Mr. B. O. C. Orlebar) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen—This meeting is, as you are aware, convened under the authority and by obligation of the Act of Parliament. It is called the statutory meeting, and shows that the company has not been established four months. During that time we, as your directors, have been taking all possible pains to bring our great mine to a successful issue, and probably it will be agreeable to you that I should tell you something of the initiation and subsequent proceedings in connection with the company. You have all read the prospectus, I need not refer to that; but I may tell you that of the 150,000 shares we offered for subscription applications were made for 223,336 shares. Of that number there were 15,000 shares which had to be taken, and were taken by the original owners of the mine in Australia, and of the balance of 135,000, we, as directors, made the very best allotment that we possibly could. We were placed in a somewhat difficult position, inasmuch as, according to the terms of the prospectus, the shareholders of the West Australian Exploring and Finance Corporation had to have some extra consideration given them, and in making the allotment it took us—and I may say that Mr. Thompson and myself were the allotment committee—till late several evenings, and ultimately we arranged it to the best of our ability, and allotted the shares. Now, you know that in the Mainland Consols we have what we consider to be one of the most valuable properties in the whole of the Murchison district of Western Australia. We were not contented with the mere reports which we received by the founders and their friends; but very wisely, I think, we have relied upon a gentleman who stands, I may say, as far as I have been able to discover, in a very first place in all the Australian colonies for reliability, honesty, and straightforwardness. I refer to Mr. Charles Kaufman, who was employed by the West Australian Exploring and Finance Corporation to report on this property. You have already seen what Mr. Kaufman said about it. Fortunately at the present moment he is the superintending mine manager of the Mainland Consols, and under his direction we are making progress, and shall continue to use our best endeavours to give you a valuable return for the moneys you have invested in this concern. Mining, as you are aware, is no certainty. It is impossible—although we may see the gold—to say how far it goes down. If our own property were a certainty I do not suppose the people originally connected with the mine would have sold you the chance of making what we hope will be a very large fortune. I think—so that you may clearly understand the position we stand in—that it would be wise for me to read to you the various reports we have received since we became directors in this company:—Last Chance. The mine manager writes under date March 25, 1895:—"The main shaft has been sunk 5 feet in hard diorite: total depth, 70 feet; and the underlie shaft has been sunk 10 feet. The reef in the bottom is now 2 feet 6 inches thick, and appears to be going down strong. After putting in some opening sets, I intend to put the men on driving towards the Central Block shaft on the course of the reef; this drive will develop the pay shoot, which is in direction. One man has been employed prospecting a bar in the top south level." The cablegram dated May 20, 1895, will be even more interesting:—"Drift from the shaft is in 100 feet."—Daly's. Under date March 25, 1895:—"The first week was spent in cleaning up the drives and winzes, in which had been stowed a lot of mullock. Since then the bottom level has been extended east 10 feet and west 5 feet; one man has been engaged prospecting on the surface. Have applied for exemption on the Mainland Block, and as soon as it is obtained will start sinking a main underlie shaft on Daly's, to be 8 feet by 4 feet 6 inches in the clear, and to carry a double truck road."—Central Block. Under date March 25, 1895:—"The main shaft has been sunk 5 feet, total 126 feet; and I have had another shaft on the property (known as Duncan's shaft) baled dry in order to see if it had developed anything of importance. We have now obtained exemption for this block, and I am putting the men on the Last Chance."—Mainland. Under date March 25, 1895:—"The straight shaft has been sunk 21 feet and logged up 3 feet, total depth 63 feet. The top level, south drive, has been driven 8 feet, and the No. 2 level driven 6 feet north. Have a man prospecting the top north level at present." These are simply excerpts taken from the reports that have been received since we have been directors of this company; but, with a view of obtaining the latest information in connection with the property, a telegram was sent to Mr. Kaufman on Saturday last, and yesterday the following telegram was received from him, dated Perth, May 20:—"The mines are being worked to their utmost capacity. Pumping engine and machinery and hoisting machinery are on the road to the mines. The width of reef is 3 feet. On Mainland mining leases, Nos. 113 and 130, drift from the shaft is in 110 feet. Mainland mining leases Nos. 114 (Daly's), 132, and 133 (central blocks) drift from the shaft is 65 feet, depth of shaft 65 feet. Main shaft is down to the water-level, and is in readiness for the machinery. Ore continues very good. Now building house for office and stores for the assorted ore. We have struck a new shoot of rich ore, which is likely to improve and hold out as opened up. We have struck fresh water. Have also acquired entire control of three additional acres, which has a valuable prospect. As soon as the new machinery is working well will decide with regard to the erection of the reduction works, after examining carefully into the matter (as to which will be most suitable for the ores)." Upon the question of assorted ore, I may tell you that if we can only get assorted ore to any extent such as I have here before me I think it will be very necessary we should have a house to protect such valuable property. The cablegram I have just read to you shows that the utmost endeavours are being made by our agents on the other side to make your property a payable one. You will see that we have not attempted to work the crushing plant at the present moment, inasmuch as Mr. Kaufman, in whom, as I have already stated, we have the very greatest confidence and the utmost reliance, tells us that before doing so he will carefully study the question as to which will be the most advantageous manner of bringing this property to a successful issue. I may say, gentlemen, that beyond the information I have already given you, we have nothing to lay before you. There is nothing to be said other than that we are doing our best, and I trust that at the annual meeting, when we shall hope to see you all here, we shall not only be in a position to confirm our belief in the value of the property, but also to give you a substantial dividend.

Dr. HADEN-HADEN said the information the Chairman had given them was of a very important character, and should induce the shareholders to hold their shares. He had considerable experience of gold mining shares, some of which was not altogether of a satisfactory character; but, having regard to what they had heard, he felt confident they had a valuable property, and one that the directors should develop as quickly as possible in order that returns might be won rapidly. (Hear, hear.) The fault he found in the management of many companies was dilatoriness on the part of the executive, who did not push on with the work of development with sufficient vigour. In this case they had no reason to doubt that the property would turn out a very successful one, and he thought the directors would act wisely in, at all times, placing the shareholders in possession of the very fullest information, and, if necessary, calling them together.

The CHAIRMAN said the directors were extremely desirous of giving the shareholders all possible information. They had nothing to hide, but, on the contrary, everything to make public. It was no easy thing to guide the affairs of a mining company; and both Mr. Thompson and he had spent many anxious hours in considering the various points which arose almost daily in connection with the business of the company. If there were any suggestions which shareholders had to make, they would, if communicated in writing to the board, receive every consideration.

Mr. WHITAKER WRIGHT pointed out that the success of a mine depended on the extent of the orebody, and reminded the shareholders of the vast extent of the orebody in the Mainland Consols. That morning he had met a miner who had just returned from the property for the purpose of purchasing some shares, and who had told him that there were no fewer than eight rich ore chutes in the mine. There were a number of rich stopes that went 5 ounces to the ton, and the reef was 3000 feet long, and was opened in five places by shafts, besides having levels in various places. He had no hesitation in saying that their property was not only the best in the Murchison gold fields, but also the best in Westralia. He was satisfied that before very long they would see their shares at three or four times their present value. In regard to the water there was no difficulty. There was an unlimited supply of salt water for running the mill, and ample fresh water for domestic purposes. The mine was equipped in a very excellent manner, and the machinery was being pushed forward, so that he thought they would have good reason to be highly satisfied with their investment in the company.

The CHAIRMAN mentioned as an additional testimony of the esteem in which the property was held in the colony that, though offers had been made to purchase some of the 15,000 fully-paid shares held by the vendors at 30s., none could be purchased under £2. The directors would use their best efforts towards making the company a success. (Applause.)

A vote of thanks to the Chairman and board terminated the proceedings.

MASHONALAND AGENCY.

The Chairman and managing director on the company's prospects.

The annual general meeting of the Mashonaland Agency (Limited) was held on Wednesday, at the Cannon-street Hotel, Mr. H. E. M. DAVIES presiding.

The SECRETARY (Mr. Herbert C. Porter) read the notice convening the meeting.

The CHAIRMAN, in moving the adoption of the report, mentioned that the company's able managing director in South Africa, Mr. Stokes, was present to address the shareholders on the investments he had made in Matabeleland and Mashonaland since the formation of the concern. As, however, this was the last time he would have the pleasure of addressing them as Chairman, he would like to refer to the company from the commencement. They registered in December, 1890, and had grown as the country had grown. They began with a cash capital of £50,600; then they issued a further £50,000 at a profit of £5000, and then came the Hirsch contract, which increased their capital by another £50,000. They had now taken over all the assets set out in the Hirsch contract, and had resold some of the shares coming to them under that contract to the extent of something over £40,000. They, therefore, practically had for their £50,000 shares held to-day the bulk of the assets, less the certain number of shares sold at that very favourable price. They had still 50,000 shares to issue, which would make a paid-up capital of £200,000, or really a cash value of £300,000, because of the premiums they would obtain on the shares which they would sell. During the 4¼ years the London expenses had only amounted to £2389, or a little over £500 per annum. With regard to the way in which the directors had laid out the shareholders' money, they had expended in buying claim rights and developing them £36,000, on farms £14,000, on live stock and wagons £1700, and on shares £16,482. All those properties were of very much greater value than when they bought them. The shares also all stood at higher prices on the market to-day than they gave for them. By December 31 they had available for further investment some £32,000, besides £16,000 liquid shares, and he ventured to say a very fine show in regard to assets as well. They had never puffed their company: they had never sounded their own trumpets or boomed the country as some had done, because they felt that the country was good enough and could take care of itself. (Applause.) The properties which Mr. Stokes had bought at different times they had turned into companies, and they had formed four, which had taken over their claims. The four companies were:—The Victoria district, the Consolidated Bellingwe Development, the Moonie Creek, and the Nellie and Pioneer Reef Development. In each case business men who had known the country had been quite willing to come forward and find the required working capital, without the expenses of advertisement or any flourish of trumpets. The company's assets had been steadily appreciating, and to day showed very large profits. These were not realised profits, of course, but they had now arrived at a time when they had good assets and a large cash reserve, and he hoped that by this time next year the shareholders would be in receipt of their first dividend. They would then, he trusted, not only pay regular dividends, but dividends which would improve as time went on.

Mr. T. RUDD seconded the motion.

Mr. H. L. STOKES, who was received with applause, said that before dealing with the immense properties held by the company in Matabeleland, he would refer to the countries in which they were so largely interested. He had been in those countries since January, 1891, as the company's representative, and he was able to say that his early impressions had been fully confirmed. He had always been highly impressed with the prospects of the country, and now, more than ever, he shared with all others who knew the country well, all confidence in its future prosperity, and belief in its great possibilities. With regard to their properties he would touch first on the mining claims, which were very large indeed. At the end of last year the number was a little over 1500. These had always been very carefully selected, and many were already giving very promising results—in fact, in a large percentage the developments had been very satisfactory. With so much mining property on their hands it had been deemed good policy to turn over and float some of the blocks in separate districts into subsidiary developing companies, and so divide the risk. Out of 900 claims in Matabeleland, the directors had this year put some 500 into three separate development companies, in each of which the agency retained a large interest, not only as holding the vendors' scrip, but as having subscribed a large portion of the working capital in each case. In the Consolidated Bellingwe the company held 14,000 shares as vendors, and £8000 of the working capital. That company had been formed on the most excellent lines, and had a total of £50,000 working capital out of £200,000 nominal. The prospects were very encouraging, and there was no doubt the company would have a good future. The second company was the Moonie Creek Development, into which they put 97 claims and 40,000 acres of land, amalgamating some properties belonging to the Bechuanaland Association. In that company the agency had 15,000 shares as vendors, and had also subscribed £15,000 as working capital, the total nominal capital being £100,000. The last and most important of the whole lot, which has just been floated, was the Nellie and Pioneer Development Company. This belonged entirely to the Mashonaland Agency, having been floated by themselves without any amalgamation of other interests; 225 claims had gone into that company, together with the Pioneer block of farmland of 30,000 acres. The Mashonaland Agency received 25,000 shares as vendors, and subscribed one-half of the working capital, thereby retaining a very large interest in the company.

which had a total capital of £65,000. Those three companies possessed every chance of great success. The last one mentioned was especially a favourite of his, as he had personally had a great deal to do in securing the ground. It was secured under very favourable circumstances, and the agency owned the whole of it themselves, without having to pay away anything, except, of course, to the Chartered Company. Special attention was directed in the report to the Umseezwe district. The highly-important point in that ground was the big block of Pioneer claims, numbering 180, banked seven deep, which stood on their own farm lands the Pioneer block of 30,000 acres. This belonged exclusively to the Mashonaland Agency and, therefore, there could never be any question between the mining company and the owners of the farm. In that kopje there were several parallel reefs, and these had immense possibilities. Pannings had given up to 17 ounces, and the place was full of old workings of a most interesting nature. Eleven shafts had been sunk, and in the No. 4 shaft a reef had been come upon over 4 feet wide, giving several ounces to the ton. In another shaft the reef had been picked up again of the same quality as in the rich old workings, proving that there must be several quartz reefs in parallel lines there. In fact, the whole kopje seemed to be honeycombed with gold-bearing reefs. Timber and water were abundant, and there would be no difficulty with regard to labour. The same district included the Nellie, which was notoriously rich. Several specimens of quartz had been sent to London, and were to be seen at the offices. Every company had been floated cheaply, with a large working capital in proportion, and for all of them there was a great future. The Chartered Company was settled with on very easy terms, so that in future sub-flotations would be free from any question with that company. The management would go on developing the ground, and he hoped that before 12 months had expired they would have formed several important sub-companies on the Nellie and Pioneer. If matters should turn out only a quarter as well as the directors might fairly expect, the agency in this point would have done well. As a set-off against the claims turned over to the various companies named, the Agency had this year acquired 400 mining claims or more, and had, therefore, kept up their total number to what it was last year. They had also received a large number of mining rights from the Chartered Company, which were always useful, because they were more and more difficult to purchase. The agreement with the Hirsch Syndicate had given the Agency an immense holding, and he congratulated the shareholders on the successful result of the negotiations. They had already realised a handsome profit, and it was impossible to say what the results would be in the future. There was another company, the Selukwe Development Company, in which the agency was interested, and out of a working capital of £20,000 they had found £5500. That company, too, had every chance of becoming a great success, as the work done up to date was most satisfactory. With the two exceptions of turning over 40,000 acres of land to the Moonie Creek Development Company, and 40,000 to the Nellie and Pioneer Development Company, the Agency had retained their balance of land, and meant to deal with it in the future. They had now altogether nearly one million acres. Bechuanaland had gone on increasing in value, and he had not the slightest doubt that the same thing would happen in Matabeleland and Mashonaland, as the two last-named were better than the first, as far as his experience went. In farther remarks, the speaker said there was an immense area of coal fields in the region of the Zambesi river, and this company had acquired a large interest therein. Concluding, he stated that the company had ample funds and excellent assets; they had experience of the country, and knew what to take up and what to avoid. As far as he was concerned, he would do his best to ensure success. (Applause.)

The motion was carried, and the auditors having been reappointed, a vote of thanks to the Chairman, directors, and Mr. Stokes terminated the proceedings.

The motion was then put, and carried, and the auditors having been reappointed, the proceedings terminated in the usual manner.

OCEANA COMPANY, LIMITED.

An increase in the capital.

An extraordinary general meeting of the Oceana Company (Limited) was held on Monday, at the Cannon-street Hotel, for the purpose of considering a proposal to increase the capital to £500,000.—Mr. H. PASTEUR presided.

The CHAIRMAN said that a vast amount of foreign capital—especially French capital—had been invested in South African undertakings during the last six months, and the expansion created by the gradual absorption and sub-division of shares, and some of the leading companies by Continental purchases, and by their introduction on the important market of Paris, had had a most beneficial effect on such of those companies as had taken the steps necessary for getting their shares quoted on the Paris Bourse. Some of the leading French firms and financial establishments with whom they had common interests in South and Central Africa had from time to time expressed the wish that they should introduce the shares of this company on the Bourse of Paris, where they already had a large number of shareholders. The directors thought that the opening of another large field for investment in the shares, and the consequent support of French shareholders, presented advantages which should not be neglected, and they, therefore, came to the shareholders to ask them to place in the hands of the board the means which were necessary to enable them to carry on the negotiations with a view to attain this object. The company had ample means in hand to carry on all its undertakings for some time to come. They did not, therefore, ask for an increase of capital because they were getting within measurable distance of the end of their resources; but because, with the increase of capital which they asked the shareholders to sanction, they hoped they might succeed in the general objects they had in view, and this at a time and under circumstances which they considered to be highly favourable to the interests of the company. The expansion of their affairs in the north in connection with the Mozambique and the Zambesia Companies was progressing most satisfactorily, and the opening of the regions north of the Zambesi, in the British sphere placed lately under the rule of the Chartered Company, and in which this company was also interested—as the shareholders might have learned by the flotation of the North Charterland Exploration Company a day or two ago—had become a question of to-day, instead of one of a more or less distant future. Another step had thus been made towards those regions of the Congo, where they had very large interests through their holding in the Anglo-Belgian Company of Katanga. An increase of capital—especially at this time, when they might reasonably expect to realise by it much more than the nominal value of the shares—would place the company in a position of very great financial strength, and enable them to take part in the gigantic resources and natural wealth of those countries which were now being opened up to civilisation and trade. The experience of the past six months justified him in stating that the additional capital raised in 1894 had enabled the company to participate in operations from which there was every reason to expect satisfactory returns. Had they possessed those increased resources earlier in 1894, they would have been able to carry out by themselves operations which had turned out very successfully, but which at that time they felt obliged, from motives of prudence, to share with other groups, or to abstain from altogether. The increase of capital proposed and the percentage which it would claim as its share of profit could not for a moment be put in the scales against the advantages which the possession of the liquid resources obtained by the issue of that new capital would place at the command of the company. As he had already stated, they had ample means at their command at present; the companies in which they were interested were mostly self-sustaining; they need spend no more money for prospecting their farms in the Transvaal, because others had provided £100,000 for that purpose by the recent formation of the Minerals Company, in which they had a predominant interest; but it was in view of the colossal expansion which was beginning to take place in Central and East Africa, where they possessed large interests, but they would welcome the issue of more capital, for which they foresaw profitable employment later on. The Chairman concluded by moving: "That the capital of the company be increased to £500,000 by the creation of 100,000 new shares of £1 each, and that such new shares may be allotted or otherwise disposed of to such persons, at such times and on such terms as the directors may think most expedient in the interest of the company."

Mr. BULLOCK seconded the resolution, which was then put, and carried unanimously.

WEST AUSTRALIAN GOLD CONCESSIONS.

The capital of the company to be increased.

An extraordinary general meeting of the West Australian Gold Concessions (Limited) was held on Wednesday, at Winchester House, for the purpose of considering a proposal to increase the capital of the company.—Mr. E. D. OPPERT presided.

The SECRETARY (Mr. Alfred Aylard) read the notice convening the meeting.

The CHAIRMAN said there was no necessity for dealing at any length with what the company had already done, for the fact that the company had, during an existence of 11 months, paid three quarterly dividends at the rate of 20 per cent. per annum, spoke for itself. At the same time, the directors felt that an explanation was due to the shareholders as to the present position of the company, and as to the aims and objects for which the increased capital was required. The shareholders were all of them aware of the fact that the capital of the company was only £32,500, of which about £30,000, or a little more had been issued. They would naturally wish to know, however, what the directors had to show for the money which had already been paid. In the first place, they had obtained a prospecting concession and prospecting rights over close on three million acres in one of the healthiest and best parts of Western Australia. They also held shares in mining and exploration companies—all of them fully paid—to the extent of between £40,000 and £50,000, and they had acquired, and were at present working, three mines which they believed to be amongst the best and soundest of the mining undertakings in Western Australia. Theirs were not sensational mines, but mines which, so far as their judgment and the judgment of those by whom they were advised went, would yield continuous dividends as soon as the proper point of development had been reached, which in the case of two had already, he thought, been attained. The first property they bought was the Lady Hynes, in the Cue district. An idea might be gathered of the terms on which that mine was obtained when he told them that it was offered to him a short time after they had completed the purchase, by an agent who did not know that the purchase was completed, for just six times the price that they had paid for it. They had in the Lady Hynes Mine at the present moment about 100 tons of ore at bank. They were not raising more ore than they required at present, because they were developing and doing dead work with their own capital. Their aim and object had been to buy good properties at a low price, and not to bring them before the public until they were thoroughly developed. In regard to the Lady Hynes, they were informed that, so far, the gold had been obtained by the very primitive method of dry blowing, and that there were at the present moment many thousands of tons of ore left in the mine which would pay handsomely to put through the battery. In regard to the water supply, they were told that one of the best water channels of the district had been secured by the lease, and that the water could be cheaply conserved by running an embankment across the channel. The next property which they had acquired was the Talisman Mine. This was a well-known property, which they had been developing for the last four or five months. They had obtained some assays of ore taken from the property, which he would not venture to read to them, so sensational were they. He might say, however, that the assay values of some of the ores—taken, not from samples, but several hundredweights—had given such rich results that if he read them, it might have the effect of prejudicing their case hereafter if the crushings did not turn out quite so rich as the assays. He held in his hand the copy of a cablegram which they had received a few days ago, the information contained in which would be appreciated by all those who knew anything about mining. The cablegram was despatched by their representative, Mr. Ellam, and read as follows:—"The new reef is opening up splendidly. The total width is 10 feet now in ore. Assays average over 1 ounce to the ton. We have now 100 feet of backs. Mine promises exceedingly well for the future." A reef over 10 feet wide, and averaging over 1 ounce to the ton, and where they had 100 feet of backs, meant that they had a mine where they had thousands of tons of ore, which, so far as his judgment went, only required stoping and crushing. They would not be in any want of water in this mine, because, according to Mr. Ellam's information, a lake was only 1½ mile distant, and ample water could be procured by sinking at the foot of the hill at the opening of the Talisman lease. "Good results," Mr. Ellam proceeded to say, "were obtained by panning, and a parcel of stone taken by me from breast of drive, and assayed in Coolgardie, returned 43 ounces 5 dwts. and 16 grains per ton. That was very rich, but it could not be compared with the sensational assay of which they had just received notice. This Talisman lease contained three known reefs which, when properly opened up, would yield sufficient stone to keep a large number of stamps occupied. The last property which they had actually bought was the Princess Royal. Seventy-three tons of ore crushed on that property had yielded 219 ounces 3 dwts., or an average of over 3 ounces to the ton. They had 150 tons of ore now at the bank, which they expected to get crushed very soon. Here, also, there was a large amount of alluvial which had not been exhausted yet; and Mr. Ellam in his report wrote:—"A large quantity of alluvial gold was obtained from this 222 feet by dry blowing, and a number of men obtained excellent results. There can be no doubt that the ore from this reef also should yield very handsome returns, if put through the battery." He also reported:—"As these mines are situated between Cue and Day Dawn, there can be no question as to a sufficient supply of water. Amongst the £40,000 or £50,000 worth of shares which they held there were also shares in the Gold Exploration of Western Australia Company, which was actively working, and which had bought one property already, and was in treaty about several others. They held founders' shares in that company which cost nothing, and those shares entitled them to a substantial share in a very valuable property which they had just bought—the Brown Hill Consols, a property extending over 36 acres, which had the reef of the True Blue and Hannan's Brown Hill, and on which ore was being raised. They hoped to get the crushing of the first 50 tons in about a month's time, when the crushing mill which was being erected in the district would be at work. This had all been attained with a cash capital of about £20,000, because a portion of their capital was paid for the prospecting rights. It was not attained without a good deal of work on the part of the directors, who had attended close upon 90 board meetings during a little over 11 months. They were being constantly offered properties of the greatest value by their representatives in Western Australia, but since the formation of the company they had acted on the principle that they would undertake no liability which they, as business men, did not see their way to carry out without any trouble whatever. The consequence was that they possessed all these properties, they had no bad debts, and they had got a handsome balance at the bank, but they had on many occasions to let really good properties slip through their fingers for want of additional capital. As to the proposed issue of capital of the £100,000 the directors did not intend to issue more than 16,250 shares in the first instance. These shares would first be offered to the shareholders in a certain proportion to their holding at the time when the issue was made. Any shares not taken by individual shareholders would then be offered to any shareholders who might wish to take a larger number of shares than their proportion. All the shareholders from whom the directors had heard so far wished to take considerably more shares than they would be entitled to, but even if the shareholders did not take a single share, the whole issue had already been taken firm and subscribed for by means of a provisional contract by parties who were very well able to carry out their engagement. (Hear, hear.) For the sake of the shareholders, he hoped they would take up their quota, but if they did not it would not in the least interfere with the successful issue of the capital. The parties who had taken these shares firm had also taken an option of a certain number of shares at a handsome premium, and if they took up this option, which he thought they would do, the company would have a very large amount of additional capital, and by the same means they would obtain a very large profit by way of premium. Part of the shares, however, would be kept in reserve for the present, and the directors did not intend to issue them at anything like their present value, because, considering the results they had attained with their small capital at their disposal, they thought they were justified in coming to the conclusion that with a larger working capital the results would at least equal, if not surpass, those already attained. (Applause.) The Chairman concluded by moving:—"That the capital of the company be increased to £100,000, by the creation of 67,500 new shares of £1 each, ranking in all respects as part of the original ordinary capital of the company."

Mr. D. F. CARMICHAEL seconded the resolution.

In answer to questions, the CHAIRMAN stated that at present the directors proposed to offer the shares to the shareholders at 30s. The terms had not been finally fixed, but they would be able to give the shareholders an important additional inducement to take up the shares, besides their being issued at a price considerably below their present market value. The number of preference shares was 15,000, and the number of deferred shares 17,500. The directors could call a meeting of the preference shareholders, and by a three-fourths majority the minority would be bound, or individual shareholders would be at liberty by an application to the board, to convert their preference shares into ordinary shares: that was to say, they would get one ordinary share where they held one preference share, without any change being made in the number of shares.

Mr. HENOCHSBERG, who had recently returned from Western Australia, referred hopefully to the future, and remarked that he was astonished at the results which the company had already attained with such a small capital.

The resolution was then put, and carried unanimously, and the proceedings concluded in the usual manner.

MURCHISON UNITED GOLD MINES.

The company's property increased.—Crushing already commenced.

The shareholders in the Murchison United Gold Mines (Limited) held their first (statutory) general meeting on Thursday, at Finsbury House, Blomfield-street, E.C., Mr. F. A. THOMPSON (the Chairman) presiding.

The SECRETARY (Mr. Martyn Milne) read the notice convening the meeting.

The CHAIRMAN said: Ladies and gentlemen—As you are aware you have been called together to-day under the requirements of the Companies' Act, compelling us to hold a meeting within four months of the registration of the company, which was on January 25, and the directors take this occasion to present to you such information as they have received regarding the property since the issue of the prospectus and the allotment of the shares on March 18, 1895, and to report the action taken by them for its development and equipment since the date of such allotment. I may say to you that the whole of the capital offered for subscription was duly subscribed and has been allotted; the amount due on allotment, 10s. per share, has been paid, and a portion of the first call, just due, has been received. The share certificates for the shares, 15s. paid, are ready, and will be delivered in exchange for bankers' receipts for this amount. The properties have been paid for, the transfers thereof duly registered in the name of the company's agent, and we are in possession of and are working the property on the company's account. The Union Bank of Australia (Limited) at its branch at Cue, holds for account, and at the disposal of the company, transfers of the property from our agent, in order that the properties may be duly transferred into the name of the company as soon as it is registered in the colony, in accordance with the Western Australian mining laws, as soon as the necessary documents for the accomplishment of this arrive from London. You will be pleased to learn that since the allotment was made our superintendent in Australia has secured an additional 3 acres, adjoining the Campania lease, on which a shaft (distant only 16 feet from our boundary) has been sunk on a leader, the value of which, upon being opened up, is reported to be from 2 ounces to 7 ounces per ton. This leader, it will be seen, from being so close to our Campania boundary, is an indication of what may be expected upon further developments as to the richness of the Campania ground in this direction. The original areas of our leases were 6 acres in the Lily block, and 6 acres in the Campania block. As you are aware, an additional 6 acres on the Lily line of reef have been secured, making the Lily a 12 acre block; and the 3 acres secured on behalf of the company now increases the Campania block to 9 acres; so that the company's property in all consists of 21 acres, an additional 9 acres referred to having been handed over to our company by the syndicate for a very small consideration, merely covering the actual expense incurred in securing the same. Since taking possession of the Lily active developments have been initiated, and a crushing of 50 tons has been made at the public mill, which produced 101 ounces of retorted gold, and the value of the tailings is stated to be 1 ounce 13 dwts. per ton, making the original value of the ore about 3 ounces 13 dwts. per ton, which must be deemed highly satisfactory. The proceeds of this and other crushings from the property, to which I may refer, will be used to meet the working expenses. We have also made a further crushing of 50 tons from the Campania, the yield from which was not so satisfactory, being only 17 ounces; and we are awaiting a full explanation from the superintendent, by mail regarding this low yield, the directors feeling assured that some adequate explanation must be forthcoming. So far, however, as we are able to judge from the cablegrams received from our superintendent regarding the matter, it would appear that the developments on the Campania Mine are not resulting so satisfactorily as we expected, and as we are still firm in the belief will yet be the result of future development. I mean by this that the reef is not proving, so far as our work has at present extended, as rich as we were led to believe, and anticipated would be the case. But as the walls are perfect and the vein maintaining its regularity and full width to and below the water level, to the depth at present maintained, the superintendent strongly recommends further development of the property, with the hope of meeting with richer ore as the work progresses, and his recommendations would seem to be warranted by the fact that in the Campania Extended, now the property of this company, and to which I have referred, the reef is much richer than in our present workings. The Anglo-Saxon property, which is also on the same line of reef, has yielded good crushings at the public battery, and, indeed, the information at our command leads us to believe that the reef is one of the best-defined in the district, and the board feels justified in expending a reasonable amount of your working capital upon judicious development in order to thoroughly prove its character. The Campania main shaft is down 125 feet to the water level, at which point there is a drive north 43 feet in length, and one south 15 feet in length; total drivage at this level, 58 feet. I may add, however, that the other developments upon our property give every evidence of satisfactory returns upon the full amount of the capital of the company. Since the formation of the company a vertical shaft has been sunk upon the Lily property to a depth of 103 feet, where the reef has been struck, having width of 2 feet

and a value of 1 ounce to 1½ ounce per ton. In a cablegram just received, the superintendent states that he has driven 13 feet on the reef at this depth, where it has a width of 1 foot, and maintains its value. In this drivage he has also sunk a small shaft below the water level for a depth of 8 feet 6 inches, which exposes the reef 2 feet 3 inches in width, panning 2 ounces per ton. This information shows the Lily reef to be a greater width here than at any other point exposed in the workings, and may be considered a favourable augury of its future development. This is, in addition to the underlie shaft, sunk upon the reef to 115 feet in depth, from the development of which the original value of the mine was obtained. From the bottom of this shaft at the water level a drivage has been made 53 feet in length to the north and 44 feet in length to the south, making a total of 97 feet of drives at the water level. Our acting superintendent, in view of the close proximity of the existing public battery (which is 800 yards distant), and as a new public mill of 20 stamps is being arranged for on the fields (the site of which will be about 1200 yards distant), suggests the delaying of the purchase and erection of crushing machinery for the present, while active developments on the mine are being carried on; so that when our mill is erected the developments will be ample to warrant its starting, and to enable it to be kept fully supplied with ore when once crushing commences. In order to carry on these developments with the greatest possible rapidity consistent with economical expenditure of your working capital, arrangements have been made for the purchase of winding and pumping appliances, which will at once be sent to the mine, sufficient to carry on the work to 300 feet in depth. Pending the results of these developments, the directors are carefully considering, and will decide upon, the nature and capacity of the milling and treatment plant to be ordered, and, in the meantime, monthly crushings have been ordered and arranged for at the local public batteries referred to, arrangements also having been made for the keeping separate, for future treatment by the company, of all tailings produced from these crushings, which will, it is thought, be a valuable asset. The importance of these crushings will be readily recognised by you, as they will thoroughly test the value of the reef from different portions of the mine as the development work progresses. The appointment of an agent to officially represent the company in the colony, and the selection of a permanent mine manager have also had the attention of your board. As you are aware, the Murchison district, in which the property is situated, compares most favourably with the other districts in the colony with respect to the quantity and quality of the water available, and you will be pleased to know that at a depth of less than 120 feet we have already, in the shafts on both properties, struck sufficient water suitable for boiler and domestic purposes, and the developments in the district and experience thus gained lead us to believe that on sinking our shafts to further depths we shall obtain a sufficient supply for all our mining purposes. I may add that in the deepest workings the best reef has been found. I shall be happy to answer any questions. (Applause.)

Mr. WILSON enquired the cost of crushing at the public battery.

The CHAIRMAN, in reply, said that they had arranged to pay 25s. per ton, which was a very reasonable charge, all things being considered. (Hear, hear.)

A vote of thanks to the Chairman concluded the proceedings.

NEW CHUM GOLD MINES.

The managing director on the property.—Some good assays.

A general meeting of the New Chum Gold Mines (Limited) was held on Tuesday afternoon, at Winchester House, Dr. A. A. TAYLOR presiding.

The SECRETARY (Mr. W. H, Bustard) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen—Your directors have taken an early opportunity of calling you together in order to give you the fullest possible information regarding your property—its past history and future prospects. Most of you are probably aware that this company took over the property equipped with one of the finest plants for pumping and hauling on the Bendigo gold field, and equal to all requirements down to more than 2000 feet. At present we are not 500 feet down, and before we reach the 2000 feet level we shall have to get through many rich saddle reefs, which have been worked in the upper levels of the adjacent properties, and which are certain, as far as anything can be certain in mining, to be found in our property. The New Chum Gold Mines (Limited) is, I believe, the only English company actively mining in Bendigo, and the conditions under which you acquired your property are so favourable to your company that there can be little doubt that the profits to be derived in the near future from our production of gold will prove us to be worthy pioneers of the Bendigo gold field in London. If the opinion of mining engineers and old practical miners, who have worked in the district since the discovery of its gold deposits more than 40 years ago, is worth anything, we may congratulate ourselves on possessing a property upon which the consensus of opinion of the whole of the local mining experts is that it is one of the finest mining leases in the field, and one that has a brilliant future before it. Now, gentlemen, a word or two about our policy in regard to development at the mines. Acting under the advice, and with the assistance of, our able managing director, we secured the services, as mining manager, of Mr. George Phillips, whose ability as an underground manager is second to none in the district, and as our legal manager Mr. W. W. Barker's services have been retained. With these gentlemen acting with us and for us in Bendigo, and with Mr. Etherington, who has had many years of practical mining experience in Bendigo, at our right hand in London, you may rely upon the affairs of your company being conducted with the greatest efficiency, and, above all, with commendable economy. You will be pleased to learn that the latter quality is one of the chief characteristics of our representatives, and, indeed, of the Bendigo managers generally, and in support of this, I may state that the Government Blue-books report dividends having been paid, in one instance, out of 3 dwts. ore, mined from a depth of more than 1200 feet. This is a record, unparalleled, I believe, in any other part of the world. As to our financial position, with the exception of 10,000 shares which we hold in reserve, the whole of our capital has been allotted, and, I may state, in proof of the wisdom of our policy in retaining the shares in the company's treasury, that only last week we received an offer to take the remaining 10,000 shares at a very handsome premium. In view, however, of the fact that, according to the latest reports from the mine, we cannot be more than from two to three months at the outside getting through the saddle which we cut at the 400 feet level, and that from all its appearances this saddle alone should yield us sufficient profit to repay the whole of our capital in 12 months, we decided to decline the offer with thanks, believing that in the interest of the shareholders, we should be acting wisely in limiting the issue of shares as much as possible. Moreover, the formation of the new company to take over a portion of our property, which we cannot possibly work in our time, will represent such a profit to this company that a good return should be made to you in cash and shares, as well as enabling us to put by a handsome sum as a reserve fund. In this connection I may state that a provisional contract has been already entered into with a powerful corporation, which should ensure a very large profit to the company. With a thoroughly first-class property, plenty of cash at our bankers for its development, and having secured the services of the very best men obtainable to manage our affairs in Bendigo, I think you will agree that we have every reason to shake hands with each other over our bargain and our brilliant prospects for the future. I have much pleasure in calling upon Mr. Etherington to say a few words to you, and to answer any questions you may wish to ask. (Applause.)

Mr. H. J. ETHERINGTON, the company's managing director, having prefaced his speech with some remarks as to the Bendigo gold field generally, said that with reference to their own concern he would give his opinion from a business point of view; he had formed that opinion, and had backed it up with his own money. He was confirmed in his view by the experience of at least three score of men whom he had met on the other side within the past five years. Those men had spent almost their whole time on the field for the past 35 or 40 years, and they certainly were men whose opinions were valuable. He had great difficulty in persuading those in with him to allow him to bring the property to London rather than float it in the colonies. In his opinion, had the opportunity been offered to the public in Bendigo, 15 minutes would not have elapsed before the whole thing would have been arranged, on what was called the Beehive—the Stock Exchange of Bendigo. He had explained to the meeting the saddle formation, and he might say that when once they got the key to the anti-clinal axis, or centre country, it simply became a matter of sinking, or time, for profits to accrue. There was not a single claim upon this lode which, properly worked, had not repaid its capital over and over again. He thought what had been done was somewhat of a record. It was impossible to point to any mining company on the New Chum lode that had not been successful. Why? By reason of the continuance or re-making of the saddles under each other, and their invariably carrying payable dirt. At their 400 feet, where they were working when he came to England, there was every indication of their being very close to the lode lying on the east of them. In consequence of the heavy flow of water, and other indications, a crosscut was put in some 64 feet east, and there they cut what at first they took to be the leg of a formation. On driving north they found that it was increasing in size, but on driving south they discovered it to be smaller and smaller. Hence they assumed that it must be the neck. However, to make sure, they put an intermediate crosscut in the shaft to prove the formation. This they did, proving conclusively to the satisfaction of nine exceptional experts that the stone cut was the neck of a saddle underfoot. These gentlemen included Mr. Northcote, manager of Lansell's 180 Mine; Mr. Gambette, manager of the Princess Dagmar; Mr. Pryor, manager of the Garden Gully United; Mr. Boland, manager of the New Chum Consolidated; and Mr. Rowe, manager of the New Chum Railway. The reports of these gentlemen were afterwards thoroughly confirmed by Mr. Bayne, who happened to be in London upon other business, and probably some of those present had seen his report on the subject. Specimens which he (the speaker) had taken from the neck where they were driving north contained nice heavy, shotty gold. He took some of it to Messrs. Johnson, Matthey, and Company, and much to his surprise, that stuff returned 76 ounces 13 dwts. of gold to the ton, while stuff taken from the south drive yielded 33 ounces 3 dwts. Specimens taken from the west leader which they cut in the shaft, went 37 ounces odd to the ton. Of course, assays to a mining man were an indication that gold existed, and that was about all; but when they had assays of stone that showed simply shotty gold giving such a high rate, he thought it was pretty conclusive evidence that the eastern shoulder, at least, of the new formation underfoot would be rich; that was, it would go ounces, and not simply a few dwts. Another important matter was that at the 400 feet level, by continuing the crosscut out east, they would cut one of the upper legs of a higher formation, which in years gone by was worked by local diggers, and of necessity abandoned owing to the heavy flow of water, and would find the 22 ounce stone which had been left by those early workers when the field was first opened up. Claims were then apportioned in small holdings of 20 or 40 yards, and nobody deemed it advisable to erect heavy machinery to cope with the water. Out to the west they knew of a shoot of gold which in its early stages yielded as high as 95 ounces to the ton, but it was estimated that 25 ounces to the ton was the worth of the gold there now. That was a part of the property which later on they would take in hand. At the crosscut at 400 feet, to which he had referred, they had very good indications, for in going through the 64 feet they went through 47 feet of rich carbonaceous slate, more or less impregnated with threads of quartz, carrying gold and galena, which had always been a never-failing indication. Some of those present might say—Why, with this gold at the 400 feet, did they not work, getting out the gold and crushing it? He would point out, in answer to such a question, that such a course would not be economical, and certainly not advisable. To mine economically and properly they must sink a shaft and get underneath and work upwards, stoping out in the most economical way. Hence the decision of the board to continue sinking the shaft forthwith, which, according to a cablegram, was now down 461 feet. On opening out at the 500 feet he had no doubt they would not only be able to keep up returns by actual crushings, but that such returns would give the shareholders every satisfaction. In order to facilitate work and get down all the quicker, some five or six weeks back they instructed the legal manager to erect an air compressor that would be equal to driving six rock-drills. Particulars had not yet been received, but, in the absence of any cablegram, the directors took it that it was in hand. Further, on their southern ground they had let two tributes to working parties. They were tribute companies in every sense of the word, and where working men put their own time and money into a concern, and were willing to pay a heavy percentage or royalty, it showed that they were on a thoroughly auriferous belt. As the Chairman pointed out, the machinery was exceptional, and it was equal to carrying them down 2000 feet without any alteration being necessary. By the time they reached that depth he thought they would be able to afford more powerful machinery; at present it was in first-rate order. The machinery and plant cost something like £8000. With reference to the sale of a portion of the property, he had pointed out that they had something like 1600 feet on the trend of the lode. To work that 1600 feet to any great depth would probably take from 80 to 100 years, and he did not think any of the present shareholders intended to hold on for that length of time. They could not possibly work it all themselves. They had had a very acceptable offer made for the portion referred to, and not only was the offer made, but a contract signed, and a deposit paid. (Applause.) From that the company would get back a very considerable bonus both in cash and shares. Shareholders were often against selling a portion of their property; but it was useless to keep their cake unless they were going to eat it, and as they could not possibly work the southern end of their property as well as the other, it was advisable to get rid of it at the best price obtainable. In order to increase the value of the company's holding in the subsidiary concern, and also to increase the value of what they intended to hold, instructions were sent to Mr. Barker, the legal manager, to acquire certain ground on their eastern boundary. Ten days ago the board received a cablegram to the effect that negotiations had been completed, and that the transfer had practically taken place. By that simple little move he thought they had acquired 30 years of life, but that 30 years, of course, would be at enormous depths. However, they had secured it, and probably at a mere domino, because others could not work it, but to this company it was important. Having the necessary machinery, and all prospecting and deadwork having been done, and having now located the centre country, and absolutely the position of saddles, not only now but also to come, the capital they had at their command was, he could assure them, ample. However, as the Chairman had said, should further capital be necessary—which he did not for one moment think would be the case—no difficulty would be experienced in procuring it. With reference to Mr. Phillips, he (the speaker) had had the pleasure of knowing him for some seven years, and he was a man who could be trusted implicitly. Mr. Barker, the legal manager, was connected with about 20 local companies, and the very fact of that position qualified him to handle the New Chum Gold Mines. Further than that, Mr. Barker was qualified by Government certificate. In conclusion, the speaker said he had a very large interest in the company, and he intended to keep it. If any shareholder desired any other information at any time, and would call at the office, he would be very pleased to afford all the assistance in his power. (Applause.)

The CHAIRMAN remarked that after the account of the mine that had just been given by the manager, and with a large balance at the bankers, they were justified in looking forward to many years of very great prosperity.

A SHAREHOLDER asked for information with reference to the proposed sale of a portion of the property.

The CHAIRMAN replied that it would be injudicious to disclose the nature of the transaction at present—(hear, hear)—as the directors had only entered into a provisional contract.

Mr. BENDELL thought the thanks of the meeting were due to the board for treating the matter as they had done. If they could sell at a profit a part of the property that would be useless to the shareholders, no point ought to be raised about it.

Mr. ETHERINGTON, replying to question, said that the company would be crushing in about four months. It was advisable to get down to 500 feet before opening out, as it would give them 100 feet of backs, and was also advisable on account of their plunger workings in connection with the pumps.

A SHAREHOLDER: How many stamps have we?

Mr. ETHERINGTON: We are in treaty for 20 stamps.

A vote of thanks to the Chairman and directors terminated the proceedings.

THE GREAT BOULDER PROPRIETARY GOLD MINES.

Excellent reports of the property.—Returns already commenced.

The first annual general meeting of the shareholders in the Great Boulder Proprietary Gold Mines (Limited) was held on Thursday at Winchester House, the chair being occupied by Mr. ALEXANDER R. ROBERTSON.

The SECRETARY (Mr. Bradley Depledge) read the notice convening the meeting.

The CHAIRMAN said: Gentlemen—Before moving the adoption of the report and accounts, perhaps you will excuse me if I make a few remarks with regard to the company. I will not detain you long, because the object of calling you together so early in the year is so that we can in future always bring our accounts up to December 31, and hold our annual meetings regularly after the accounts are received at the end of each year. I should like further to say that we have every reason to believe that the company is making very great progress, and is doing remarkably well. We have in all, as you know, several shafts which have been sunk. We are not now prospecting; we are practically in working trim and order. Without going into details as to what levels and shafts have been opened, I may say we have altogether nine shafts at varying depths from 46 feet to 200 feet, the main shaft being now at 200 feet. We have also sent to the property a 10 stamp mill, which from the results you will have seen is now working, and working satisfactorily. This meeting being held for the special purpose of getting the accounts up to the end of the year, we have no annual report from our manager. We simply have the monthly reports as to how the company's property is being developed. I may say that the directors have every reason to be satisfied with the way in which Mr. Lane is working out the problem we entrusted to him. There has been some delay inevitable in opening up a new country like the one we are interested in. We began our crushings in April last, and I think that the results which have been published in the papers are eminently satisfactory. A total of something like 2000 ounces of gold has been deposited in the bank—taken out of the mine, milled, and deposited. That is, of course, outside the amount we expect to hear of on Saturday as the result of the last clean-up, and which our manager has promised to cable to us. With regard to our financial position, I am glad to say we are very strong, indeed. In mining companies my experience has been that, unless there is sufficient capital to meet any eventuality which may occur, they are apt to get into serious trouble. But we are extremely strong in our position. We have, in the first place, as I have told you, £8000 taken from the mine and milled, and we have also a further working capital of some £18,000 in hand in the shape of calls. At present we have not made them because we did not think it necessary, and I trust we shall not have to do so. While on the subject I may mention that we have had applications from many shareholders wishing to pay their calls up in full, and some 4697 shares have so been paid up, and I take this opportunity of saying that if any shareholder wishes to pay up his shares in full he can do so, and though we do not absolutely require the money, we do not wish to say that any shareholder has not got the right to take this course. In such a case either we issue new shares or else we mark the old certificate as fully-paid. I do not think there is anything more I can say to you to-day. I see in the room a gentleman who has arrived from West Australia (Mr. Brookman), who, having been on the spot, has probably more knowledge of the property than anyone present. Mr. Brookman was Chairman of the Coolgardie syndicate from whom we bought the property, and I am sure that anything he says to you will be fully substantiated. After putting the resolution, I shall ask him to address you. The Chairman concluded by moving the adoption of the report and accounts.

Mr. G. M. INGLIS seconded the motion, which was put, and carried unanimously.

Mr. BROOKMAN said: Mr. Chairman and gentlemen—I have been asked by your directors to address you to-day in regard to your properties; and, although I do not pose as a mining expert, I am glad to be able to say that I am in a position to give you reliable and satisfactory information, as I recently visited the mines, and spent eight days in making a thorough examination of the properties, in conjunction with Mr. W. G. Brookman, the managing director of the Coolgardie Company, and Mr. David O'Neill, who has had charge of the developments on the whole of the properties owned by the Coolgardie Gold Mining and Prospecting Syndicate for the last eighteen months. These properties include the five Boulder claims, Lake View, Royal Mint, and the nine blocks now held by the Associated Gold Mines. Before dealing with hard facts, it may interest you to have a little information about the inception of the company and its early operations. Rumours having been current in Adelaide of the discovery of a large auriferous belt, extending from the Dundas in the south to the Murchison in the north, and these having been confirmed, we immediately formed a syndicate in Adelaide, and dispatched Mr. W. G. Brookman as leader, with Mr. Pearce as prospector. These two had previously met on a South Australian field but with poor success, and were anxious to try their luck in the West. They left Adelaide in June, 1893, and after a long and very rough trip arrived at Coolgardie. On their arrival the report came of a new rush at Hannan's Find, and they immediately went out to try their fortune there. Arriving at Hannan's, they met two successful diggers who had a magnificent show of stone. After exchanging the usual digger's welcome they lent them their dolly (a small hand-machine for extracting gold). The result was so satisfactory that it raised the instinct in Mr. Pearce which had been lying dormant, and they immediately decided to prospect the district. Pearce was much struck with the peculiar formation of the Ironstone Hills; it was an axiom with him that "the iron cap-covered the golden head." The immediate result of their efforts was the discovery of the claim now known as the Ivanhoe, which was registered in Melbourne. The stone crushed from this mine has averaged over 4 ounces to the ton. Instead of applying for a reward claim, our prospectors worked away and discovered the Great Boulder, which in the original telegram was described as "an immense ironstone hill impregnated with gold, with very rich reefs running through." About a week after the discovery a marvellously rich vein was cut, from which assays up to 400 ounces were taken. This was a very rich vein in the middle of the main body, and the whole body taken across, including this vein, gave in crushing the very handsome return of 15 ounces to the ton. As the shaft was sunk on the underlay the vein was left in the hanging-wall, and is not now being worked. This shaft was sunk to a depth of 87 feet. At 60 feet a drive was put in 74 feet to the south, at the end of which, at the time of my visit, a face of ore 14 feet wide existed, carrying stone, which O'Neill assured me would crush 5 ounces to the ton, and that the men in this face could keep a 10 head battery going. A drive has also been put in for 60 feet at the same level north—1500 feet south from the underlay. A new shaft has been started with the hope of cutting a lode a 60

eet. This has since been accomplished. About 100 feet south of this shaft another shaft was started on Christmas Eve (and is named after the day). The same lode has been cut in this shaft from which splendid stone is being raised. In a private letter received from the manager of the Leviathan Crushing Company, who is of a pessimistic turn, he stated this stone would crush fully 10 ounces to the ton. To show the impossibility of estimating the value of your claims, take, for example, the Boulder South Claim, on which, before a reef was cut, a costeen 900 feet long, by an average depth of about 12 feet, had to be sunk. Three distinct lodes running parallel to the Great Boulder Block were disclosed by this costeen, and a shaft 90 feet deep, at the time of my visit, was sunk on the western lode. The lode when cut in the 12 feet trench was only 3 inches wide, but gradually widened to 4 feet of solid quartz, and from it I took some very fine specimens; 100 yards to the south another costeen, 300 yards long and 12 feet deep, disclosed the same lode that the shaft is sunk on as well as others. I have every reason to believe that the stone lately crushed was taken from this shaft on the Boulder South, and that on the Christmas Eve. Without enumerating the developments on each block, let me say that the developments carried out have proved that the reefs run right through the entire length of the four Boulders. I have already referred to the Boulder South, and will now give you the developments on the Boulder Extended, which is the northern block of the company. Three distinct lodes are known to exist. No. 1 shaft is down 63 feet on a 5 feet lode of nice quartz, showing gold freely, while on the Boulder North a shaft is sunk 60 feet on what is known as the Ivanhoe No. 4 lode, which carries excellent gold; 100 yards to west of this lode a shaft is sunk to 30 feet, and it is intended to continue to the 100 feet level, and then drive back to No. 4 lode, which is east of this; about 150 yards west another shaft is sunk 50 feet. To give some idea of the value of the Boulder properties, let me say that the reefs are proved for about 5000 feet in length. The developments on the Boulder Extended on the north, and the Boulder South on the south, with the different works on the other blocks (which I have already enumerated) on the line of reef, clearly prove that the reefs traverse the entire length of the property. An excellent supply of timber for firewood exists on the claims, and some 3 miles off trees from 30 to 60 feet high and 3 feet in diameter provide all the wood necessary for shafts, bed-logs for engines, &c. A steam saw-mill is at work preparing wood for the various shafts. The want of water has been our greatest trouble, and fully explains why shareholders have been unable to get earlier crushings. In December last the various companies of which I have the honour to be a director requested me to visit the mines, and gave me full authority to arrange with your mining engineer for the establishment of a water trust. After visiting the lakes some 3 miles distant, which, at the time of my visit, had a fine sheet of fresh water, we decided to carry out the work which had been strongly recommended by Mr. W. G. Brookman 18 months before. Last week the work of laying 3½ miles of pipes, and providing pumping plant was completed, and the mines now have a supply of water for all purposes. In addition to the water trust which has been formed between the Great Boulder Associated, Lake View, and Royal Mint Companies, a very large reservoir has been constructed between the Great Boulder and Lake View Hills. This gives this group of mines the key to the position. Gold they have in abundance, but without water it would have been impossible to extract it from the ore. I congratulate you on having secured these valuable claims. When I tell you that the Coolgardie Company spent £40,000 on the group of mines taken over by the London companies, and that the Adelaide vendor's shares are still intact, it ought to be a sufficient guarantee of the faith we have in the property. From the commencement, Mr. Pearce, who I consider is one of the ablest prospectors that any company could employ, assured me that these properties would pass our most sanguine expectations, and, although he has had every inducement to sell, he has held on to his shares, and is now one of the largest holders. There is one other matter. I may say, frankly, that when I saw the stone from the claims sent down by the prospectors, I was a little discouraged. In fact, I was like a lot of other people—I did not understand it. Not knowing anything about it, I went to somebody who did; and Mr. Parkinson—one of the best mineralogists in South Australia—as soon as he saw the ironstone said:—"Wherever you have got that, you have got something good underneath it." When he saw the stone from the different claims in the cases he got quite excited. In a few days he got assays of 20 and 30 ounces, and some even as high as 100 ounces. I and the prospectors hold a very large interest in these shares; and although we could have made a small fortune by selling the shares, we have held on, and intend to do so, believing thoroughly in the property. The ironstone is not a solid hill. There is a cap of 10, 20, and 30 feet in thickness, and you can knock off piece after piece and see gold in it. I have had the stuff tested, and they can extract 98 per cent. of the gold, so that when the railway is finished and the cost of carriage and other things is lessened, you have got a very valuable asset in the ironstone without touching the reef at all. I may say that where the excavations were made for the battery, which is now, I suppose, almost erected, there was a sort of limestone formation, some of which was taken down to the tent, and gave a very good assay. I may also tell you that the gold you get is very valuable. It is almost pure—23½ carat. We get £4 4s. 4d. per ounce for it. I can again congratulate you upon having obtained this magnificent property—for so it is. If we push on with the developments, I believe you will have a great surprise in the future. (Applause.)

Mr. JOSEPH enquired whether Mr. Brookman had any idea when the railway he had spoken of would be completed.

Mr. BROOKMAN replied that he believed it would be finished before another 12 months.

Mr. JOSEPH enquired when the shareholders were likely to receive a dividend.

The CHAIRMAN replied that they had already had two crushings, and these had realised, as he had mentioned, £8,000. The board were very anxious to pay a dividend, and would do their very best towards that end. They were all largely interested in the success of the company. Before putting the next resolution he wished, on behalf of himself and the board, to thank Mr. Brookman for the able way in which he had addressed the meeting. (Applause.)

Resolutions confirming the election of Mr. John Waddington and Mr. G. P. Doolette to the board, and re-electing Mr. G. M. Inglis and Mr. Gamble North, as directors, were carried unanimously.

Messrs. Price, Waterhouse, and Co. were reappointed auditors.

Mr. DOOLETTE, in returning thanks for the confirmation of the election of himself and his colleague to the board, expressed the strong conviction that the shareholders would not have to wait very much longer for a dividend, having regard to the production of the mine in the past few months.

Subsequently an extraordinary general meeting was held, at which the directors were empowered to establish a local board in the colony, and also a colonial register of shares.

A vote of thanks to the Chairman and board concluded the proceedings.

THE RETIREMENT OF Mr. T. W. NEWTON.—Students and others attached to the old Royal School of Mines in Jermyn-s rest will regret to hear of the retirement of Mr. Thomas William Newton, who for 35 years has occupied the responsible position of Assistant-Librarian at that institution, on account of the new Treasury order relating to age. Mr. Newton, besides having been joint author with Mr. Henry White of the first printed catalogue of this library, published in 1878, had acted for some years as private librarian to Sir John Lubbock, Bart., M.P., and to the late Mr. Charles Darwin.

GOLDEN PLUM CONSOLIDATED.—The company has acquired a further 12 acres next to the Missing Link. The crushing plant is leaving London by the *Nairnshire* on the 25th inst.

LONDON AND WEST AUSTRALIAN INVESTMENT COMPANY, LIMITED.

A successful flotation.—Land at Perth rising in value.

The statutory meeting of this company was held at the offices, Broad-street House, on Wednesday, Colonel R. PARRY NISBET, C.I.E. (Chairman of the company), presiding.

The CHAIRMAN said: Gentlemen—Your presence, as shareholders in this company, has been invited here to-day in compliance with the provisions of the statute which requires such a meeting to be convened within four months after the registration of the company, which dates from February 9. It is not usual or necessary at a statutory meeting of this kind to make any elaborate or detailed statement of the affairs of a company such a very short time in existence, but I am glad to assure you that on the present occasion your directors are happy to meet you and submit full information of the progress they have at present made in the business which you have entrusted to them. They are convinced that the report they have to make will afford you all every gratification as promising results of a very sound, beneficial, and permanent character. It is not too much to say that the public confidence shown from the outset in this company is hardly equalled, and certainly not surpassed, by any of the undertakings, numerous as they have been, brought out in London in connection with West Australia during the past 12 months. The original subscribers to the Articles of Association of this company, as perhaps you are aware, were themselves so convinced of the soundness of the project in which they invited your assistance, that they each subscribed for 1000 shares, instead of a much smaller number usually applied for. The share capital of the company is, as you are aware, £100,000 in shares of £1 each, fully-paid, before delivery of the scrip. The flotation of the company was in every way most successful. There was no occasion for inviting underwriting of any part of the capital, and not a penny has been spent in promotion or advertisement of the company before or since it went to allotment on February 19 last, and already the shares are at a satisfactory premium. Your directors have desired to keep steadily in view that this company is not merely an undeveloped gold mine, the prospects of which must be more or less entirely speculative, but this company they consider partakes more of the character of a permanent investment and trust corporation, and your directors believe they will best meet the wishes of the shareholders by safe-guarding the funds entrusted to them from anything like blind speculation, and investing them only in undertakings that, after ample scrutiny, promise satisfactory profits of a secure and continuing character. The attention of your directors is not infrequently invited to schemes which the projectors of them seek to support with funds wherever obtainable, with the fewest questions asked. It may be that through over-caution your directors now and again might let something fairly good slip; but better so than risk a loss which more foresight or less easy compliance would have avoided. In this connection it affords me the utmost pleasure to assure you that the directors feel that they and every individual shareholder in this company cannot overrate, and may warmly congratulate themselves on the zeal, ability and intensely loyal regard to the interests of the company which they find in their general manager, who has thrown his whole energy and long and valuable experience into their affairs, and is himself a tower of strength in their successful management. This company has scarcely been four months in existence, and you would not altogether expect that, feeling our way, as it were, at first, any great amount of investment work had been done. It is, therefore, with the more pleasure that I can report in that respect very considerable progress, and that several investments, which appear to be of a most suitable and promising character, have been entered into. This company possess in the friendly relations existing between them and the London and Western Australian Exploration Company an asset, if I may so speak, of a most valuable character, and which we on our part highly appreciate. Your directors wish that this friendly union may long remain close and strong, to the honour and advantage of both companies, in a field of labour and investment where there is ample room for both. The London and Western Australian Exploration Company and ourselves can command a wealth of advisory talent in West Australia, which, perhaps, no other alliance affords. The fact of being at once able to obtain reports from mining engineers, experts, and business men of eminence on the spot, keen in the discovery and appraisement of sound investments, full particulars of which they can, without loss of time, cable to their principals in London, must always prove a factor of overwhelming advantage to investment companies like the London and Western Australian Exploration Company and ourselves. Doubtless, most of you gentlemen here to-day know well the name of Menzies, in the Coolgardie district, as a locality so highly eulogised by Mr. Florence O'Driscoll, M.P. for country Monaghan, than whom no better informed, more observant or careful expert has yet visited the gold fields of West Australia. Of Menzies, Mr. O'Driscoll said that he saw more gold there in a day than he did in the whole of the rest of the colony put together. The public in London seem to have satisfied themselves that the reports of Menzies are not exaggerated, but well confirmed, if the recent successful issue of the Menzies Gold Reefs Proprietary Company, all on that field, is accepted, as I think it may well be, of the phenomenal results that may be expected at Menzies. Well, gentlemen, your directors have pleasure in telling you they have secured one-half interest in 15 of the most valuable leases at Menzies, covering an area of 234 acres, at a price which cannot fail to prove most profitable, the other half having been bought by the London and Western Australian Exploration Company. If, therefore, the first quarter of the initial year of its existence this company had made no other investment, this property at Menzies would probably furnish a more than very appreciable dividend on our shares for the year. Your directors are confident that this property at Menzies will enable them to turn over several times the sum paid for it, the intention being, after a certain amount of development work, and evidence of the gold which may be fairly assured lies under the surface of this large area, to dispose of some parts of the property to the highest bidders, who will not be far to seek. There is another class of investment, which experience in the Californian and South African gold fields, in towns like Johannesburg and many other places, has shown to be of a most suitable and profitable character. I refer to the acquisition of land for building sites, or public purposes, in places and towns which have rapidly grown or sprung into life through the impetus afforded by the mining industry, and the large increase of population and local trade it brings with it. Take, for instance, the fair city of Perth, the capital of West Australia. You will hear on all sides that building is going on space at Perth, and that the value of land and open spaces there has increased tenfold in the last three or four years, and is still daily increasing. The Governor of West Australia, who has lately returned to England on short leave, has spoken in glowing terms of the prospects which the discovery of gold over 100,000 square miles of the Province he rules promises for that country; and Sir William Robinson speaks of the remarkable extension of building in Perth itself, and other new townships, such as Coolgardie, Cue, and the Murchison fields. The reports which your directors are constantly receiving from engineers and architects on the spot entirely confirm the fact that the price of convenient building sites is rising day by day in these and other towns in a most incredible manner. If, as may be reasonably expected, the prosperity and growth of population in West Australia goes on increasing by leaps and bounds, in consequence of the constant new discoveries of gold, then much of its newly-found wealth will be laid out locally. The demand that has set out for finer buildings, of the most modern construction, cannot be met quickly enough, and will not be satisfied for some years to come, and building sites have everywhere acquired a value the oldest settler never dreamt of a few years ago. Your directors have, therefore, not hesitated to make some investments in land in good situations where the best class of buildings must come. They have purchased a fine block of land of 1350 acres at Perth, for a price which cannot fail to be most profitable. Similarly, at Coolgardie and Cue, where large towns have been laid out and are rapidly rising up, they have secured several valuable blocks for building sites, with frontages to the principal streets at from three to five years' rental of the same. The company are erecting buildings on one of these blocks at Cue, where £2000 will be spent on a building in the centre of the town, and the best business quarter suitable for offices, a bank, or club, and also on one of their blocks in Coolgardie. The annual rental will, as long as the company retains possession of the building, yield a very good profit indeed, though if sufficient inducement offers, it may be more profitable to sell any of these sites or buildings and reinvest the money. If carefully chosen, there is probably at present no class of investment likely to prove more profitable than the acquisition of town sites. Further, on behalf of this company, a moderate interest has been acquired in three gold mining companies, whose prospects and development appear to promise, without long delay, results of a very substantial character. One is the Great Fingall Reefs Company (Limited), whose leases extend over 264 acres, with 2 miles of gold-bearing country, where the ore already in sight is reported by the local manager as sufficient to maintain a mill of 20 stamps at work for 10 years. Another is the Consolidated Murchison Gold Mines (Limited) which consists of several properties, with a total area of 91 acres, all carrying gold, and in a forward state of development; indeed, one of the group of mines—the Day Dawn—has been showing most valuable returns for several months, and the latest report from the mine, dated May 13, gives the crushing for the previous fortnight as "410 tons, 311 ounces, without tailings." There is a mill of 20 stamps at work on the property, while arrangements have been made to increase it to 50 stamps by a very early date. A third property, in which this company holds a few shares, is the East Murchison Gold Mining Company (Limited) which presents prospects of solid prosperity unsurpassed by any other mine in those fields. The shares of all these companies are not obtainable except at a much higher price than that at which this company acquired their interest in them. Gentlemen, the details I have now given you will be sufficient, I trust, to satisfy you thoroughly that your directors have been diligent in your service during the short time since this company was formed. We shall proceed most cautiously and continue to exercise the most watchful care over your interests. Our prospects, as a company are most excellent, and we have every confidence that the shareholders will, within the first year, be more than amply satisfied with their investments in the dividend they will, in all reasonable probability, receive. (Cheers.)

Mr. THOMAS: What is the capital of the Fingall Reefs?

Mr. MORRING: £175,000, of which £150,000 is issued and £25,000 is in reserve.

Mr. VERE SMITH: Of our authorised capital of £100,000, how much is issued?

The CHAIRMAN: Rather less than half.

Mr. THOMAS: How many shares do we hold in Fingall Reefs?

The CHAIRMAN: A block of 10,000.

On the motion of Mr. THOMAS, seconded by Mr. VERE SMITH, a cordial vote of thanks was passed to the Chairman.

PHŒNIX UNITED MINES.

Progress of the liquidation.

A special meeting of shareholders in Phœnix and West Phœnix United Mines was held at Webb's Hotel, Liskeard, on Thursday, May 16, Mr. W. POLKINGHORNE (purser and liquidator) presiding.

Accompanying the notice convening the meeting the liquidators issued a circular, which stated that in the absence of any material improvement in the mines they would not advise operations being continued, except possibly for a short time longer. Since the last meeting there had only been an inconsiderable loss, and a large proportion of the arrears of calls had been paid. The Duchy of Cornwall, the lords, had agreed to accept a surrender of the setts on certain conditions, one of which would undoubtedly be that the pumping must be continued for a reasonable time to enable the mines to be taken over by fresh lessees.

The Liquidators now presented the following report:—

"From December 14 (when the resolution was confirmed for voluntary winding-up the company) the workings have of necessity been on a limited scale. For nearly three months we had very severe weather which considerably interfered with our progress. The water in the eastern mine, which rose to within a few feet of the 100 fathom level below the adit level, has only been kept at that point with difficulty. The accounts since the liquidation commenced show 119 tons of tin sold, at an average of £36 15s. per ton, realising £4361. The minimum price obtained was £33 15s., and the maximum (at the last sale on the 7th inst.) was £40 17s. 6d., showing an increase of value of about £7 per ton. The continued working of the mines has been carried on up to this date without an appreciable loss to the shareholders." The statement of accounts further showed total debits from December 18th to May 4th, amounting to £4325, including labour costs £2955 and merchants' bills, coals, &c., £1364. Tin sold was credited at £4407, giving a profit of £82; but Mr. Clinton explained that they had had the benefit of a week's tin, for which costs were not charged, so that actually there had been a small loss on the five months' working. They were now getting £7 2s. 6d. per ton more for their tin than they were in December."

Mr. BAIN: What progress has been made in the collection of the arrears of calls?

Mr. CLINTON replied that the total arrears amounting to £2346 4s. 6d. had now been reduced to £751 5s. 8d. (Applause.) Every penny due for arrears on the relinquished shares—amounting to £717—had been paid. It was intended to distribute these payments in a dividend to the creditors of the company, who had been very forbearing in not forcing proceedings.

Captain WILLIAMS stated, in reply to questions, that, at the present price of tin, there would be no great loss on working the mine for the next three months.

Mr. BAIN, in moving that the liquidators be empowered to continue the operations at the mines for the next three months, said it would be a lamentable occurrence for the Liskeard district for the concern to be discontinued. Under proper management, and with

a judicious outlay of capital, no mine in Cornwall had better prospects. (Hear, hear.) The liquidators had exercised a wise discretion in not rushing the sale of the property until the market improved. The results of the operations as laid before them that day were extremely satisfactory.

Mr. VIVIAN seconded, and the resolution was carried unanimously.

Mr. R. H. WILLIAMS, C.E., remarked that Phœnix had very great prospective value. The main lode was one of the largest in Cornwall, and even in the world, while the two side lodes, which had never been seen except on the surface, would be equally rich on development. The liquidators had the utmost confidence in the future of the mine, and, with a better price for tin, hoped to sell at such a price as would cover their debts, if not pay a dividend to the shareholders.

Mr. EDGCUMBE suggested forming a Limited Liability company among the present shareholders, and after some further discussion, the meeting terminated.

[COMMUNICATED.]

THE TREATMENT OF PYRITOUS CONCENTRATES BY CYANIDE.

AT the monthly meeting of the Chemical and Metallurgical Society of South Africa, Mr. A. F. Crosse read the following paper on the above subject:—In bringing this subject before you, I have nothing that is particularly new or startling to state, but I consider that it is the chief business of this society to bring forward the various processes used on these fields and have them thoroughly discussed, and by so doing we can give everyone an opportunity of seeing where we are, and of knowing what has been done, and what remains to be done, and prevent men from wasting their time and energy in repeating what has already been worked out. I do not claim to have had more experience in treating concentrates, or even as much as some of you present; however, I have long taken a great interest in the question and the results of some of my experiments may prove interesting to you, and serve to raise discussion, which will be still more so. Before starting the subject, I must remark that my experiments have been confined chiefly to the treatment of concentrates won by Frue vanners, and that this class of material is generally in a very unfavourable state to treat by cyanide. I do not myself believe that Frue vanners, or any other form of close concentration, is advisable, but as it is still carried out here I will give you my ideas on the treatment of such concentrates by cyanide. Amongst those not thoroughly conversant with the cyanide process, the idea is prevalent that if the free acid can be neutralised, then the chief source of the decomposition of the cyanide is removed. Such, however, is not the case. I made a series of experiments on a ton of concentrates that I bought from the New Chimes Gold Mining Company (Limited). The concentrates contained 7 ounces 3 dwts. fine gold per short ton, and when washed with water, the wash water contained no iron or free acid, but decomposed a large amount of cyanide, owing to the presence of an insoluble basic ferric sulphate. I treated 1000 grammes with dilute hydric chloride for two days (1 acid to 10 water), and after washing I obtained in the solution 2·62 grammes of iron as ferrous chloride and 2·33 grammes as ferric chloride. There were also 2·31 to 3 grammes in the solution, and a trace of copper. This iron taken up by the weak hydric-chloride had been in the state of basic-ferric sulphate, and though not soluble in water it is acted on by a weak cyanide solution, giving rise to complicated reactions. Ferrous sulphate and cyanide of potassium form in the first instance, ferro-cyanide of potassium; but if any free acid be present, this ferro-cyanide is converted into Prussian blue if ferrosoferric salts are present. Ferric sulphate, like ferric chloride, is decomposed by cyanide of potassium into hydric cyanide and ferric hydrate. Knowing the reason for the undue decomposition of cyanide by material containing partially-oxidised pyrites, the remedy would at once occur to anyone—namely, treatment with some cheap acid such as hydric sulphate or hydric chloride. I tried experiments with both, which were equally successful, and I will give you the result of one of them. I started two experiments—side by side—under identically similar conditions, except that in experiment No. 1 the concentrates had been digested in weak hydric chloride and well washed. In experiment No. 2, the concentrates were treated in the natural state. In both cases I used 2 grains of cyanide of potassium diluted. After six days treatment—

No. 1 gave a decomposition of cyanide equal to .. 0·66 grms.
No. 2 gave a decomposition of cyanide equal to .. 2·84 grms.
or 5·3 times as much.

I had to add more cyanide to experiment No. 2, when the 2 grammes first added were decomposed. No. 1 had yielded up 84·3 per cent. of its gold, and No. 2 only 51·8 per cent. Months after having made these experiments I heard that Mr. W. Bettel obtained very similar results at the Robinson Gold Mining Company; but, at the time, I had no notion that he was experimenting on the same lines as myself. I have also made a series of experiments with hypo-sulphite of soda, as basic ferric sulphate is converted into soluble ferrous sulphate by this salt, but these experiments I will not enter into, as they were only partially successful. I tried an interesting experiment on some concentrates from the Jumpers Gold Mining Company last November. These concentrates contained about 3 ounces of gold per ton, and about 60 per cent. bisulphide of iron (pyrites) and some basic ferric sulphates. After treating with acid and washing well, I proceeded as follows. 1000 grammes were taken. I leached with 1000 c.c. 0·3 per cent. solution of cyanide, and I arranged it in such a way that the filtrate dropped into a Woolff's bottle full of oxygen, which was forced by the filtrate, bubble by bubble, through the cyanide solution. After passing the solution through three or four times a day for six days, I had on extraction of 93·5 per cent. of the gold, and had used 0·5 grs. of cyanide, or about 1 lb. per ton. I bring these experiments before you to show that in my opinion the cyanide is capable of much extension, and I consider that ores and products, now considered impossible to treat advantageously, will be successfully treated in time. Any method leaving ferrous or even ferric hydrate in a freshly precipitated form in the concentrates would not answer, as cyanide of potassium takes up these hydrates to form ferro or ferric-potassic cyanide. There is an interesting fact in connection with ferric hydrate—if you subject it to a temperature of 121° C. for some time in water under pressure of one atmosphere, you dehydrate it to a certain extent, and then it has no action on cyanide of potassium. I tried various experiments to utilise this fact, but they failed, as I still had the ferrous hydrate to think of; but this effect of heat led me to trying the effect of heating the concentrates to a still higher temperature, and after various experiments I was very successful, as I converted the insoluble basic ferric salts into soluble ferrous salts and ferric oxide, by merely heating the concentrates till sulphurous acid was given off.—The best method of treatment is the following:—The concentrates are to be heated on an iron plate or some other suitable arrangement to a temperature just below dull red heat. After cooling they are put in a vat, and thoroughly well washed with water. I consider it advisable to add a little hydric sulphate to the first two or three washes, to prevent any soluble basic ferric sulphate being formed in the tank from the strong solution of ferrous sulphate. The washing must be continued till no iron is found, by testing the wash water with potassic ferric cyanide. Then give a wash with lime water. The subsequent treatment with cyanide can be carried out in the usual way, though it is advisable to have the solution slowly percolating all the time. I may state that concentrates treated in this way leach very easily, and that I got about 88 per cent. of the gold dissolved in 14 days. Of course, the question arises, which method would be advisable for a mine to adopt? Would it pay better to sell 3 ounce concentrates to a chlorination work, or treat them at the mines on the plans I have described? I have not the slightest hesitation in saying that for 3 or 4 ounce concentrates the cyanide process would pay much the better of the two; though the extraction might be rather less, the saving in cost of treatment and cartage would be very great. Having given my ideas on the cyanide treatment of concentrates obtained by close concentration, I am enabled by the kindness of my friend, Mr. J. R. Williams, to give the results of five months' treatment of concentrates obtained by using spitzkasten. The concentrates from Frue vanners cost from 17s to 30s. a ton to win, whereas the concentrates obtained by spitzkasten cost under 1s a ton. These latter concentrates are very easy to cyanide as they leach very well, and have had no chance to oxidise, and, therefore, decompose very little cyanide. Details of results of cyaniding concentrates at the Crown Reef Gold Mining Company (Limited):—

1894.	Assay value. Dwts.		Theoretical extraction. Per cent.		Actual extraction.		Cost. s.	d.
October	23	..	90·21	..	73·14	..	8	11
November ..	18·27	..	89·76	..	84·92	..	8	0·7
December....	17·00	..	91·17	..	91·13	..	8	0 3
1895.								
January	15·25	..	91·80	..	91·67	..	7	3·3
February	13·75	..	86·09	..	87·86	..	7	11·88

Time, 13 days' treatment, and about 1·25 pound of cyanide was used per ton of concentrates treated. If we compare these results with results obtained by close concentration with Frue vanners and similar appliances, and subsequent return by selling such concentrates to chlorination works, I do not think that any unbiassed person would hesitate in choosing between the two methods. There is only just one little question of doubt, which, as time goes on, we shall have to encounter—will the ores from a greater depth than those we are now working give the same results with cyanide?

It was resolved to postpone discussion on the paper until the next meeting of the society.

THE SANDYCROFT FOUNDRY AND ENGINE WORKS COMPANY (LIMITED).—In view of the large and increasing demand for electrical plant for mining operations, this eminent firm have founded a special electrical department at their Sandycroft Works, near Chester. They have also been fortunate in securing the co-operation of the well-known electrical engineer—Dr. N. S. Keith, and to whom the credit of much of the early pioneer work in connection with the application of electro-motive power to mining is due.

NICKEL AND NICKEL-STEEL.

By FRANCIS L. SPERRY. Cleveland, O.

UP to within a few years, the consumption of nickel has been more directly dependent upon the available supply than that of any of the other useful metals.

The Gap Mine, in Lancaster county, Pennsylvania, has been for the last quarter of a century the only property in this country furnishing nickel in paying quantities. Its yearly output was about 300,000 lbs. of metallic nickel, or nearly half the amount used annually in the United States. Foreign nickel from mines in the New Caledonia Islands, in the South Pacific, found entrance into our markets as the production of the Gap Mine fell off. The price of nickel was constantly maintained, and no special effort was made to extend its use. Over-production was cautiously guarded against, and all surplus metal was held by the banking-houses of the Rothschilds, who assumed the bonded indebtedness of the Société le Nickel. The opening of the Ontario Nickel Mines has, however, brought about a radical change; and nickel from the Sudbury district can be delivered in New York within four days, and in European markets within two weeks, as against two months consumed in transporting South Pacific ores. Former prices have been irretrievably smashed, and European trade journals comment favourably on the influence which Canadian nickel has had in making lower prices, and breaking the backbone of the "nickel trust."

Production and Costs.

The quantity of nickel produced, and the prices which it commanded, may be briefly summarised as follows:—

The total production of the world from 1840 to 1860 was about 100 to 250 tons yearly of metallic nickel; from 1860 to 1870, 600 to 700 tons yearly; from 1870 to 1889, about 1500 tons yearly; in 1890, 2000 tons; and a fair estimate for 1894 is about 5000 tons. The metal sold for $2·25 per pound in 1860; in 1873 to 1875, for $6 to $7 per pound. From that time the price of nickel gradually declined, being $0·65 per pound in 1892, and less than $0·40 at the present time. The exceedingly high prices in 1873 to 1875 were caused by the adoption of a nickel coinage by Germany and some other European nations, causing a sudden demand which exceeded the supply.

Properties of Nickel.

Nickel has similar physical properties to those of iron and copper. It is less malleable and ductile than iron, and less malleable and more ductile than copper. It alloys with these metals in all proportions. It has nearly the same specific gravity as copper, and is slightly heavier than iron. It melts at a temperature of about 2900° to 3200° Fahr. A small percentage of carbon in metallic nickel lowers its melting point perceptibly. Nickel is harder than either iron or copper; is magnetic, but will not take a temper. It has a greyish-white colour, takes a fine polish, and may be rolled easily into thin plates or drawn into wire. It is unappreciably affected by atmospheric action, or by salt water. Commercial nickel is from 98 to 99 per cent. pure. The impurities are iron, copper, silica, sulphur, arsenic, carbon, and (in some nickel) a kernel of unreduced oxide. It is not difficult to cast, and acts like some iron in being cold-short. Cast bars are likely to be porous or spongy, but, after hammering or rolling, are compact and tough. A piece of pure nickel rolled plate (A) and an untreated cast bar of nickel (B) were submitted to physical test by the writer, at the works of the Carbon Iron Company, Pittsburgh, Pa., with the following results:—

Cross section. Inches.	Length between fillets. Inches.	Ultimate strength per square inch. Pounds.	Reduction area of Per cent.	Ultimate elongation. Per cent.
A—3·11 by ·045	8	69,390	31·5	31·4
B—0·623	2	30,[illegible]	6·5	6·5

The following table shows the properties of the metal:—

TEST OF STRENGTH OF MALLEABLE NICKEL.

Material.	Tensile Strength. Pounds per square inch.	Elongation. Per cent.	Remarks.
Casting	85,000	12	
Wrought nickel	96,000	14	Wrought from 2 by 4 inches to ½ inch square.
Wrought nickel, annealed	95,000	23	Wrought from 2 by 4 inches to ½ inch square.
Rolled nickel	78,000	10	Very hard, because not annealed after rolling; rolled from 2 to ½ inch.

These figures are an average of a number of tests. As there were flaws in several of the specimens, the results are lower than they otherwise would have been.

Nickel readily takes up carbon, and the porous nature of the metal is undoubtedly due to occluded gases. According to Dr. Wedding, nickel may take up as much as 9 per cent. of carbon, which may exist either as amorphous or as graphitic carbon, or in both conditions. The affinity which nickel shows for carbon is manifested in a striking manner in the Mond process of refining nickel.

Dr. Fleitmann, of Germany, first discovered that the use of a small quantity of pure magnesium would free nickel from occluded gases and give a metal capable of being drawn or rolled perfectly free from blow-holes. Magnesium in nickel, like manganese in steel, acts as a purifying agent, and it improves the ductility and malleability of nickel to such an extent that the metal may be rolled into thin sheets 3 feet in width. Aluminium or manganese may be used equally as well as a purifying agent; but either, if used in excess, serves to make the nickel very much harder.

Nickel Alloys.

Nickel will alloy with most of the useful metals, and generally adds the qualities of hardness, toughness, and ductility. It is commonly alloyed with copper and zinc in making the composition known to the trade as German silver, white metal, British plate, packfong or Chinese metal, argentan, electrum, and Maillechort, the hardness and whiteness of this alloy depending upon the percentage of nickel it contains. Nickel coins current in Germany, Belgium, Italy, the United States, and Latin American countries, contain 25 per cent. of nickel and 75 of copper. German silver has a considerable use in electrical fixtures and appliances, having a very high specific resistance.

The alloy known as "Christofle" is composed of 50 parts nickel and 50 parts copper. As yet comparatively little use is made of this alloy in the United States; abroad, it is largely employed in the manufacture of coachmakers' and saddlers' supplies, as well as for surgical instruments.

Analyses of nickel alloys of various countries do not show very great difference in the percentage of nickel.

ANALYSES OF NICKEL-ALLOYS.

	Copper. Per Cent.	Nickel. Per Cent.	Zinc. Per Cent.	Iron. Per Cent.	Cobalt. Per Cent
Berlin Alloys.					
Richest	52.00	22.00	26·00	—	—
Medium	59.00	11.00	30.00	—	—
Poorest	63.00	6.00	31.00	—	—
French Alloys.					
Tableware	50.00	18.70	31.00	—	—
„	50.00	20.00	30.00	—	—
Maillechort	65.40	16.80	13,40	3.40	—
Austrian Alloys.					
Tableware	50.00	25.00	25.00	—	—
„	55.60	22.20	22.20	—	—
„	60.00	20.00	20.00	—	—
Sheffield Alloys.					
Silver White	55.20	20.70	24.10	—	—
Electrum	51.60	25.80	22.60	—	—
Hard alloy*	45.70	31.30	20.00	—	—
English	60.00	18 80	17.80	—	3.40
„ elastic	57.00	15.00	25.00	—	3.00
Chinese packfong	40.40	31.60	25.40	2.60	—
American Alloys.					
Alloy for castings	52.50	17.70	28.80	—	—
„ „ bearings	50.00	25.00	25.00	—	—
Bullet shell	75.50	24.10	—	0.40	—
One cent coin	88.00	12.00	—	—	—

* Can be worked cold.

		Per cent.
Vivian and Co., Swansea, copper-nickel alloy	Si,	·303
	Fe,	·826
	Cu,	48·49
	Ni,	50·09
Société le Nickel, Paris, copper-nickel alloy	Si,	·186
	S,	·089
	Cu,	48·740
	Ni,	49·26
	Fe,	·610
Wiggins and Co., Birmingham, copper-nickel alloy	Si,	·136
	S,	·041
	Cu,	47·68
	Ni,	49·87
	Fe,	1·228

Steel and Nickel-Steel.

It will hardly be questioned that scientific research is directed most energetically at the present time upon the art of uniting elements in such proportions that they may be more serviceable than in their pure state. The limit of ultimate strength in the practical application of pure metals has about been reached. The practical introduction of steel into general use has made a new era in manufactures, and "steel is only modified iron; the difference in its state from a condition as soft as copper to one as hard as glass being due to the modifications of carbon." Up to recent times the distrust of steel was so great that marine and civil engineers were afraid to use it. In the early days of the Pennsylvania railroad, its steel rails were imported from England, bent to the curves of the railroad. As superior metal for cutlery and tools it brought a fancy price of 36 cents per pound. To-day our battle-ships are sheathed with thousands of tons of the best steel, and 800 tons are used yearly in the manufacture of steel pens. Carbon-steel was a great improvement over iron, and the use of nickel in steel is found, in all cases in which careful investigation has been made, to mark a further improvement in the manufacture of steel. A German authority has recently observed that, considering the mutual affinity of nickel and iron, as shown by the presence of nickel in meteoric iron, it is remarkable that the example of the handiwork of Nature had not been copied before this.

In a paper read before the Iron and Steel Institute, Mr. James Riley, manager of the Steel Company of Scotland, says:—

"If the engineers of those stupendous structures (the Forth Bridge and the Eiffel Tower) had had at their disposal a metal of 40 tons (ultimate) strength, and 28 tons elastic limit, instead of 30 tons strength and 17 tons elastic limit in the one case, and (say) 22 tons strength and 16 tons elastic limit in the other, how many difficulties would have been reduced in magnitude as the weight of material was reduced!"

Mr. Riley's paper was the first to present publicly the merits of nickel-steel, and attracted much attention.

Just about that time the Ordnance Bureau of the United States Navy Department was seeking the best type of armour-plate for the new battle-ships, and the superior qualities of nickel-steel were brought to the attention of the department. Secretary Tracy authorised a comparative trial of three armour-plates forged at the largest steelworks in France and England, and representing the best types of simple steel, nickel-steel, and compound (hard and soft) steel armour-plates. The result of this trial in September, 1890, indicated so strongly the superior merits of nickel-steel that Congress was justified in granting an appropriation for the purpose of purchasing the necessary quantity of nickel to continue experiments. These experiments were uniformly successful, and the Navy Department adopted nickel-steel for armour-plate, and, wherever possible, in the work of the Ordnance Bureau. Nickel-steel armour of the best quality is now regularly produced by two of the large steelworks of Pennsylvania, the Bethlehem Iron Company, and Carnegie, Phipps and Co., which have special facilities for handling this class of work. The former concern forges all its plates, while the latter employs rolls.

The Harvey process of hardening the face of nickel-steel armour by cementation to the depth of several inches, with subsequent water hardening, is an important advance in making nickel steel armour still more effective.

The type of armour-plate used by the British Admiralty is a compound plate made up of a hard steel face and soft steel backing. They considered the question of the best armour for their battle-ship as settled in 1878, when they adopted this type of armour-plate. Comparing the relative depth of penetration in the Harveyised nickel-steel, all-steel, compound, and soft steel armour-plates, the ratio of superiority in favour of the Harveyised nickel-steel plate is as follows, in the order named:—

Relative penetration.	Kind of armour plate.	Relative resistance.
1·	Nickel-steel, Harveyized.	1·
1·64	All steel.	0·609
1·75	Compound.	0·572
2·2	Soft steel.	0·455

so that for equal power of resistance there can be a saving of 43·8 per cent. in weight in favour of the Harveyised plate over the compound plate. The ordnance trials at the Indian Head proving-grounds are as severe as any in the world; and it is with pardonable pride that the Bureau of Ordnance of the Navy regards the placing of an order for nickel-steel armour-plate by the Russian Government with the Bethlehem Iron Company as an acknowledgment that we have to-day, the material and facilities, and are forging in this country armour and projectiles that have no superior in the world.

Krupp, of Essen, is furnishing, for vessels of the *Brandenburg* class in the German Navy, nickel-steel armour made on a new system. The plates are 5½ inches thick, and show a resistance equal to plates of 9½ inches made by the old system.

The French Government uses an armour-plate containing 0·4 per cent. carbon, 1 per cent. chromium, and 2 per cent. nickel.

Nickel furnishes toughness; and chromium, hardness. It is in the highly desirable qualities of extreme toughness and elasticity that nickel imparts valuable properties to steel, increasing its resistance to shocks and hindering crystallisation.

(To be continued.)

* Paper read before the Florida meeting of the American Institute of Mining Engineers.

COMPANY FINANCE.

Reports, Balance Sheets, Dividends, &c., of Mining and other Companies.

Devon Great Consols.

The directors, in their report for the year ended April 30, say that the accounts show a credit balance of £2012, and on the receipts and expenditure account a balance of £2246. At the meeting of shareholders the directors hope to be in a position to announce the declaration of a dividend. The amounts received for arsenic and copper ore would have been considerably more but for the severe winter. The floods of November and December, followed by the severe snowstorms and frosts of January, February, and March, have militated greatly against the company, and it is a matter for congratulation that greater damage and loss were not thereby sustained. A satisfactory contract has been made for the sale of arsenic for 12 months at an advanced price, and it is also pleasing to observe the recent rise in the price of copper, with every probability of a further advance.

The Champion Reef Gold Mining Company of India.

The following is the directors' introduction to Captain Rowe's interim report for six months to March 31, 1895:—At the last annual general meeting the directors submitted to the shareholders a report from Captain Rowe, the superintendent, on the mining operations for the year ending September 30, 1894. They have now the pleasure of enclosing a report from that gentleman for the first six months of the current financial year, viz., to the end of March last. A great amount of work has been done during the half-year, and the developments have been of a highly satisfactory character. A perusal of Captain Rowe's report will show that from north to south, with scarcely a break for the entire length of the property, a profitable lode has been opened up. Garland's shaft has been sunk during the half-year 111 feet in a lode varying from 1 foot 3 inches to 5½ feet wide, of an average assay value of 2 ounces 10 dwts. 21 grains of gold per ton, the total depth on the 31st March being 883 feet. The sinking of Ribbledale's shaft has been resumed, and Captain Rowe reports that the prospects here have considerably improved during the past six months. An important feature in connection with this part of the mine is that the lode has "folded," and has developed into three distinct branches, all of which are good. Carmichael's shaft is being sunk in a rich lode of the width of 4 to 5 feet, and of an assay value of over 2 ounces of gold to the ton. In Rowe's shaft the lode has varied from 2 to 3 feet in width, of an average assay value of nearly 3 ounces of gold to the ton. An immense amount of work has been done in driving, rising, and sinking in a rich lode. The following table furnishes particulars of the results obtained during the half-year:—

Period.	Quartz stamped.	Bar gold produced.	Quantity of tailings treated.	Bar gold extracted.	Total bar gold produced.	Standard gold.	Net amount realised.
1894.	Tons.	Ozs.	Tons.	Ozs.	Ozs.	Ozs.	£ s. d.
October ...	3895	5380	1050	223	5603	5,493·370	21,391 10 0
November	3900	5383	1135	222	5605	5,507·422	21,416 11 0
December	3950	5389	1100	229	5618	5,513·681	21,444 19 3
1895.							
January ...	3900	5346	920	239	5585	5,522·671	21,519 2 11
February.	3807	5404	1000	232	5636	5,523·870	21,520 14 10
				*318	318	114·458	441 10 6
March ...	3870	5408	1160	232	5640	5,646·585	21,567 13 9
	23,215	32,310	6365	1745	34,055	33,241·043	129,302 2 3

* This was from the skimmings of tailings which had been accumulating for some time.

Notwithstanding the steadily increasing output the reserves of quartz for the half-year show an increase of 25,000 tons since the end of September, 1894, when the company's financial year ended. This addition is equal to the increase for the whole of the preceding 12 months. The total quantity of quartz in reserve at the end of March was estimated at 95,000 tons. The accumulation of tailings now amounts to 60,000 tons. As soon as the board have determined upon the best method of dealing with this asset, additional plant will be provided. As the capacity of the present 80 heads of stamps is not equal to the treatment of the quantity of quartz opened up monthly in the mine, a new battery of 20 heads of stamps has been ordered, making a total milling power of 100 heads of stamps. It is anticipated that these new stamps will be running in the course of a few weeks. It is not improbable that the directors may deem it desirable ere long to increase the stamping power still further. As to the future, Captain Rowe says, "the mine is opening up remarkably well, and there is no doubt but that we have a good future before us. We are increasing the reserves considerably. The lode as far as seen at deeper points, presents a most favourable appearance for a continuation of the good productive ground in depth." For the current year, commencing October 1st last, an interim dividend of 4s. per share, or £40,000, was paid on the 4th instant. Another interim dividend for the second four months of the current year will be paid in September next.

Zeehan-Montana Mine (Limited).

The annual report of the directors states that the mine continues to open out in a very satisfactory manner. The task of developing the first level has been pushed forward, and nearly all the lodes there intersected have yielded a fair amount of ore of good average value. The sinking of the main shaft for a further depth of 100 feet, making a total from the surface of 223 feet has been completed, and drives are now being put out with the view of cutting the same lodes at the 192 feet or second level. No. 4 lode has already been successfully intersected and found in a payable condition, and it is expected that No. 1 lode, which proved so productive at No. 1 level, will be met with in about four months' time. A new lode has been discovered, now called No. 5, which is of a very promising character, and has at the surface proved so far highly remunerative. Steps are now being taken to develop it in depth by means of a prospecting shaft, and a telegram received from Hobart on the 9th inst. states that rich ore is still being found. Despite the very low prices which have prevailed for both silver and lead, the operations of the company have been attended with considerable profit, out of which the directors have been enabled to declare two interim dividends of 8d. and 4d. respectively per fully-paid share, and a proportionate sum per partially-paid shares. After debiting

profit and loss account with the latter of these dividends, and writing off the sum of £1492 for depreciation, there will still remain a balance to the credit of that account of £3241, out of which the board recommended that a further dividend of 4d. per fully-paid share and 2½d. per partially-paid share be declared, making a total distribution for the year of 1s. 4d. per fully-paid share, and 10d. per partially paid share. This will absorb £1214, and allow of the sum of £2027 being carried forward. Since the date to which the accounts have been made up, the mine has continued in a profitable condition, and prospects are encouraging.

South African General Development Syndicate.

The directors have issued to the shareholders a report as to the progress of the company, which states:—"The large and important Oceana Company and the Northern Transvaal Lands Company are owners of a vast extent of territory in the Transvaal, much of which is gold-bearing, and some portions diamondiferous. The right of exploration of some of these promising areas was acquired by the Oceana Development Company, which has handed over a portion of its concessions to our company for a similar purpose, and we have also arranged to select 10 farms from those owned by the Northern Transvaal Lands Company in localities where there are good prospects for gold and diamonds. The aggregate of these properties amounts to fully 120,000 acres. The directors have been fortunate in obtaining the sanction of the Oceana Development Company to the employment of their agent at Johannesburg—Mr. Jameson, brother of the Commissioner of Mashonaland—to act as their agent, and this gentleman, who has great experience, has been instructed to organise three fully-equipped prospecting parties to explore the farms known to be gold bearing. Preparations are being made to start exploring operations in the Bloemhof district, in the south-west corner of the Transvaal, where a geological similarity exists in the formation of the country to that of the diamond-bearing regions at Kimberley. In the meantime the directors have been able to secure a substantial interest in 250 claims owned by the African Gold Properties Company, situated in the Rand, closely adjacent to the Violet Consolidated and Champ d'Or Companies' ground, and which, it is understood, will shortly be dealt with in such a manner as, we hope, will insure the company a very considerable margin of profit. The company can also explore and deal with properties other than those owned by the Oceana Development Company and the Northern Transvaal Lands Company, and the directors are in communication with another large land company to acquire rights over its areas. The directors will take care to keep the shareholders fully informed as to all developments, and trust ere long to be in a position to be able to make some further favourable announcements."

Champ d'Or Deep Level Company.

The London agents have received advice by the incoming mail that a proposal has been made for the purchase of this company's assets and engagements by a company which it is proposed to form for the acquisition of the Champ d'Or Deep's property and certain adjoining properties. The name of the new company will be the French Rand Gold Mining Company (Limited). Its capital is to be £560,000, which is to be divided as follows:—(a) To the Champ d'Or Deep Level Gold Mining Company (Limited), as the purchase consideration for all its rights, properties, assets, claims, and demands, shares of the nominal value of £175,000; (b) to the Compagnie Générale des Mines d'Or (Limited), for its property, rights, assets, &c., shares of the nominal value of £100,000; (c) to the owners of the claims known as the Kitsey Block, as the purchase consideration for such block, shares of the nominal value of £110,000; (d) to the owners of the 37 claims (or thereabouts) known as the Lockhart, Albu, Bacon, and Bedford claims as the purchase price thereof, shares of the nominal value of £20,000; working capital, £75,000; and reserve, £80,000. Of the 75,000 shares of working capital, the parties making the offer undertake to take up at the rate of 45s. for each £4 face value shares of the nominal value of £5,000. The remainder, viz., 70,000, are to offered to the shareholders of this company at the rate of 25s. for each £1 face value. Any balance not taken up by the shareholders is guaranteed at the same price. In consideration of the guarantee aforesaid, the gurantors are to have the option to take up within a period of three months from the date of the registration of the proposed company £35,000 in nominal value of the reserve shares at the price of 30s. for each £1 face value, and to take up the balance of the said reserve shares—namely, £45,000 nominal value, within a period of twelve months from such registration at the price of 40s. for each £1 face value.

The Golden Dove Mining Company.

The following circular has been issued to the shareholders:—"Since the date of the last circular to the shareholders, Mr. G. Warrington Rogers, upon the corroboration of whose original report upon the Golden Dove property it will be remembered that the company was formed, has returned to England, and the directors have had the advantage of several interviews with him, in which he has been able to give them much valuable information. In the first place you will learn with satisfaction that, after further experience and examination, his opinion of the nature of the Golden Dove property is very much enhanced, and he believes that the Golden Dove reef is even richer than he had first estimated. The directors have succeeded in purchasing, through Mr. G. Warrington Rogers, in accordance with powers held by him, a nearly adjoining property through which the reefs on the Golden Dove property run, as well as (subject to certain conditions) an intermediate block through which they also run, and which may, and probably will, prove of the greatest value to the company, which will then possess a continuous run of about a mile upon valuable reefs, the number of which is found to be very much greater than was at first believed. The operations of the company, and the very satisfactory nature of its prospects, have, the directors are informed, attracted considerable attention in Natal, and neighbouring properties are being prospected and taken up by others. In the face of this, and of the expenditure incurred in obtaining and developing the additional properties above referred to, and others in the neighbourhood which it may possibly be advisable from time to time to obtain—either with a view to working or to their advantageous resale to subsidiary companies—it is intended to propose that the nominal capital of the company be increased from £50,000 to £60,000. Accordingly, a general meeting of shareholders will be held on Thursday, May 30, at 3 o'clock, at the offices of the company, 65 and 66, Chancery-lane, London, at which Mr. G. Warrington Rogers will be present, and which you are particularly invited to attend, in order to hear from him the information and particulars which he is prepared to give. A special resolution will then be passed, if the shareholders so determine, increasing the nominal capital as above. It is not intended that the additional shares should be allotted at once, but that they should be held in reserve, and available for the purposes explained, as and when it may be thought advisable. Considerable time has necessarily been occupied in preliminary work, in obtaining possession, and in sending out machinery, &c. This latter, however, the directors believe to have now reached the mine, and its erection and starting will be proceeded with as energetically as possible. Finally the directors believe that they may congratulate the company on possessing a mining property which is likely to be equal to any in South Africa. Mr. John Pullman and Mr. James Putney, both large shareholders, have been duly elected directors. The following is the special resolution which will be put to the meeting:—'That the capital of the company be increased by 10,000 shares of £1 each, to be issued by the directors as, and when they think desirable.'"

Van Ryn.

A circular states:—"I am instructed to inform you that the directors have been approached by the New African Company (Limited) with an offer to form a new company to acquire the northern portion of this company's property outside the mynpacht. The directors have had under consideration for some time past the advisability of prospecting and developing this portion of the company's estate, and they are now of opinion that the best means of attaining this object, having regard to the additional capital required, will be by the formation of such a company as is now such suggested. In this view the board are supported by the opinion of Dr. Magin and the other members of the local committee. The directors have, therefore, approved provisionally of the following scheme, and now recommend it for the acceptance of shareholders:—A new company to be formed called the Van Ryn North Exploration and Mining Company (Limited), with a capital of £170,000, in 170,000 shares of £1 each. This company receives as purchase consideration in fully-paid shares of £1 each, £70,000; to be issued for working capital at 10s. per share premium, yielding £75,000, for which shareholders in this company will first be entitled to apply in proportion to their holdings, £50,000 (this issue is guaranteed at 30s. per share by the New African Company, Limited); reserved for future issue, over which an option has been granted for two years, at 32s. 6d. per share, in consideration of the above guarantee, £50,000. In addition to the above-mentioned purchase consideration of 70,000 shares, this company will receive 25 per cent. of the net profits on all sales of the property that may be made in future by the new company, thus reserving a further substantial interest therein. The property to be transferred comprises surface and mineral rights over about 6,000 acres, upon which, up to the present, no development work has been undertaken, although the existence of a reef has been ascertained. An agreement embodying the above terms of sale will be submitted at an extraordinary general meeting of shareholders which has been convened for the 28th inst. Shareholders of this company on the register on the 23rd May have the right to apply for shares in the new company, and in the event of the approval of the agreement at the forthcoming meeting, application forms will be sent out to all shareholders showing the number of shares in the new company for which they are entitled to subscribe."

Anglo-French Exploration Company (Limited).

The secretary intimates that dividend warrants have this day been posted for the final dividend of 12½ per cent. on the original issue, making a total of 22½ per cent. for the year 1894.

New Comet Gold Mining Company (Limited).

The London committee of this company have now been appointed, and consist of Mr. Edward Wagg, Mr. S. Neumann, Mr. Max Michaelis, and Mr. F. A. Robinson; secretary, Mr. Wm. Henderson Clark. The allotment letters for the shares in the above company, it is expected, will be posted to the East Rand shareholders within the next day or two.

Angelo Gold Mines (Limited).

The following gentlemen have been elected to act as the London committee—viz., Mr. Stanley Bailsford, Mr. Herman Irwell, and Mr. Thomas Matesdorf; secretary, Mr. William Henderson Clark. The allotment letters have been posted to all those who are entitled to an allotment, and those wishing to accept the same should have done so prior to the 18th May. Any further acceptances of the allotment will, however, be received up to Monday, the 27th inst., after which date none will be accepted.

New Kleinfontein.

The secretary has given intimation that the London committee will now issue bearer shares to all applicants wishing to have the same in place of certificates.

Middlesborough Town and Lands Company.

The directors have issued the following circular:—The financial arrangements referred to at this company's meeting on April 9 last have been completed, and the board has received official notification from the Watts Steel and Iron Syndicate that, subject to an agreement to be made with the Middlesborough Water Company, their works will be put into operation for permanent working within 60 days. The continuous working of the Watts furnaces has always been regarded as of vital importance to the development of the town of Middlesborough and the success of this Company, and your directors being satisfied as to the improved condition and prospects of the iron trade in America, and of the intention and ability of the Watts Syndicate to take advantage of it, congratulate their fellow-shareholders upon the fact that the necessary funds have been provided, and that these extensive works will soon be in operation, provided with ample capital for the conduct of a large business. The position and prospects of this company are now a source of considerable satisfaction to your directors; the company is free from debt, and has available funds at its disposal sufficient to provide for management expenses for some years to come, irrespective of collections on land, notes, and realisations of other assets, from which the company's manager expects to derive a considerable income on the revival of business in the town of Middlesbrough, after the starting of the Watts Works.

— The directors of the ANGLO-CHILIAN NITRATE AND RAILWAY COMPANY (LIMITED) will, at the approaching annual meeting, recommend to the shareholders a payment of one year's arrears of dividend on the preference shares, at the rate of 7 per cent. per annum.

— The produce of the WASSAU (Gold Coast) Mine for the month of March last realised £1308 10s. 10d. Ten stamp battery worked 14 days 19 hours, and crushed 300 tons, producing 307 ounces standard, giving a yield of over 1 ounce per ton. In addition to this, tailings put through 12 stamp battery produced 28¾ ounces standard, making a total return of 335¾ ounces standard. Cablegrams have since been received advising the remittance for last month as 347 ounces bullion, and a yield of 1 ounce 2 dwts. per ton.

— A dividend of 6d. per share has been declared by the VICTORIA (Charters Towers), payable on and after 7th June next.

— At the annual general meeting of the SAN DONATO NITRATE COMPANY (LIMITED) a dividend of 2½ per cent. for the year was declared.

— The transfer-books of the SOUTH AFRICAN ESTATES AND MINING COMPANY (LIMITED) will be closed from the 24th inst. to the 7th prox.

— Mr. Oliver Pegler has left for Johannesburg on behalf of the AFRICAN GOLD PROPERTIES (LIMITED) as resident consulting engineer.

— The directors of the DAY DAWN BLOCK AND WYNDHAM have sold through Messrs. Johnson, Matthey, and Co. (Limited) the bullion ex s. *Merkara* for £6426 13s. 8d.

— The directors of the MOSMAN have sold through Messrs. Johnson, Matthey, and Co. (Limited) the bullion ex s. *Merkara* for £1805 6s. 8d.

— The register of members of the AFRIKANDER GOLD MINING COMPANY (LIMITED) will be closed on the 23rd to the 27th of May, inclusive.

CENTRAL BUFFELSDOORN.—Negotiations are proceeding for the acquisition of 158 immediately adjoining claims, which will make a total of 382 claims.

HANNAN'S STAR GOLD MINES (LIMITED).—Letters of allotment have been posted.

The Mining Journal,
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An Illustrated Record of Mining, Metallurgical, Railway, Financial, Industrial, and Engineering Progress.
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CONTENTS

Of this Number of "The Mining Journal, Railway and Commercial Gazette," May 25, 1895.

LONDON: MAY 25, 1895.

THE ELECTRIC LIGHTING OF MINES.

THE introduction of the electric light for ordinary use in mining operations is, perhaps, more general in foreign than in home mines, as few of the metalliferous mines in this country are now conducted on a large scale. We do, indeed, know of one small lead and blende mine in Wales, owned curiously enough by a French company, where the electric light has been erected in the mill, but as the mill has not been worked for some considerable time, its use has been somewhat restricted. We visited this mine a few months ago, and were much surprised to find ourselves in the midst of a little French colony, and as a meeting of the administrators was being held at the moment it was not difficult to imagine ourselves back again in the South of France. At this mine steam was employed as a motive-power for the mill; arrangements were also made for the smelting of the ore on the spot, in spite of the almost prohibitive cost of coal. The dynamo, also, was driven by steam-power, and was intended to light up the mill and smelting-works by means of incandescent lamps and the outside yards by means of a search-light, whose rays were directed from a window in the mill on to any spot outside where work was going on. This same search-light had, so we were informed, been the cause of much dismay and terror to the inhabitants of the hillside farms when the playful spirit of the French manager had caused it to be directed in their direction; while the whole arrangement seemed to us to have been put up without any consideration of its cost and advisability, and, in fact, was an excellent example of how things ought not to be done. Now, the first question to be decided in this, as in all other mining matters, is, whether it will pay; or, if the cost is not less than other means of illumination, are the advantages such as to lead to its adoption in spite of its greater cost? One great factor in deciding this point is that of motive-power, whether steam or water. Few metalliferous mines are advantageously situated as regards the cost and transport of fuel, so that if steam has to be used it will probably be found that the cost of electric lighting is prohibitive, unless large open spaces are to be illuminated, such as are common in quarrying, whether in the open or in underground chambers, where numbers of men, horses, and engines are employed, and which, by a judicious arrangement of the lamps, can be lit up without causing dark shadows. From personal experience, we know that these shadows are expensive, not only because work cannot be carried on within their boundaries, but also because they form refuges in which those disposed to idle can skulk out of sight of the foremen. This must be borne in mind when erecting the poles from which the arc lights are suspended; and although the use of electricity is now so general that most men have a rough idea as to its capabilities, it may not be out of place to intimate that, in the event of a lamp going out, it cannot be lit up again by the application of a match. We have known this experiment tried, and were much surprised, when going on our morning rounds in a large quarry, to find the contents of a box of matches at the foot of one of the poles, and to learn that they had been used in vain endeavours to relight a 2000 candle power arc lamp. We imagine that the experimentalist would have been considerably astonished if the arc had suddenly struck up during the process. If steam is out of the question, as it too often is, then in water we have the ideal motive-power, especially if it can be obtained for nothing, or if the price per inch be not excessive. A separate motor from that used for the general purposes of the mill is essential, and for this purpose a small Pelton wheel coupled direct on to the shaft of the dynamo is perhaps the best—that is if the water is under a sufficient head, or of sufficient pressure to drive the wheel at the high rate of speed required by the dynamo, otherwise intermediate shafting and belting will be necessary. The efficiency of the system and the life of the incandescent lamps will largely depend upon the maintenance of absolute regularity in the speed, and this cannot be obtained if the motive-power is used at the same time for general purposes, such as crushing, stamping, and concentrating machinery. Hence a delicate governing appliance is a necessity, and of these there are several types, whether for steam or water motors, which in the last case are more suitable and automatic than the somewhat primitive method of putting a Chinaman to manipulate the lever of the deflecting nozzle of a Pelton in obedience to the dictates of a speed indicator or ammeter in his neighbourhood. While we frankly admit that Chinamen have many good qualities, we know that as speed governors they are not so efficient as the automatic mechanical appliances used for that purpose, the cost of one of which could easily be covered by the destruction of lamps involved by the manual method.

Coming now to the actual dynamo or machine which generates the electricity, we must before purchasing decide upon the system to be adopted, as the type of machine will vary according to whether arc lamps alone, or incandescent lamps alone, or a combination of arc and incandescent lamps is to be used. Lighting by arc lamps is suitable for large open spaces by means of a few powerful lamps fixed at the heads of tall poles. Incandescent lighting, on the contrary, is adapted to the illumination of the interior of mines, mills, workshops, and offices by means of a large number of lamps of small power—say, each equal to 16 candles—which can be put wherever they are required; and once the line of insulated conducting wires is established give no further trouble, except for renewal from time to time. The dynamo—with the outward form of which our readers are familiar, and of which several illustrations will be found in our advertisement columns—is a machine for converting mechanical force into electric energy, and produces the current required either for lighting purposes or for reconversion after transmission to a great distance into mechanical force. The power is applied either direct or by belting to the shafts of the armature, causing it to revolve at a high speed between the poles of the field-magnets. The small amount of residual magnetism in these excites a current of electricity in the insulated copper wire coils of the armature, and this current, feeble at first, increases the magnetism of the poles, which, in their turn, excite an increased current; and so the machine, after a few revolutions, attains its maximum output. Now the type of dynamo, and the work which it will do, depend upon whether the whole or part of the current generated in the armature is allowed to pass through the coils of the field-magnets. If the whole passes, then we have the series dynamo, which is especially used for supplying current to a large number of arc lamps coupled in series—that is, the current passes through the whole of the lamps one after another. In other cases, a portion only of the current passes through the field-magnets of the dynamo, and this latter is then said to be shunt-wound, and is adapted for the purpose of charging accumulators, although, with certain modifications, it could also be used for arc or incandescent lighting.

The third and last form of dynamo which we will at present take notice of is the compound, the field magnets of which are so arranged that the whole current generated by the machine runs through a portion of them, while the other portion is shunt-wound, the coils being made of fine wire through which a portion

of the current is shunted from the terminals of the dynamo. The advantage of this arrangement is, that, provided the speed is regular, the electromotive force, or electric pressure, will remain constant irrespective of the number of ampères which may be required from it by any variation in the outside circuit due to one or more lamps being turned off. The compound dynamo will supply both arc and incandescent lamps at the same time, and is just what is required in mining operations where both the illumination of the open spaces surrounding the surface works, and the interiors of mine, mill, and offices have to be provided for. It is important that the dynamo should be erected on a firm foundation, in a spot free from damp and dust, and, if possible, in a room by itself, to which only the properly-qualified attendant has access.

The arrangement of the conducting wires forming the lamp circuit is generally designed by the firm of electrical engineers to whom the work is entrusted, and who, if they are in the near neighbourhood, will undertake the erection themselves; otherwise, a plan of the mine buildings and open spaces is submitted to them upon which they mark out the distribution of the wires and their gauge, the situation of lamps, switches, cut-outs, and other electric arrangements, and this plan must be adhered to by the manager, or he may expect serious trouble from neglecting to do so. It is impossible, we all know, to force more than a given quantity of water through a pipe of a given diameter, so also it is equally impossible to force a greater current of electricity through a wire than it is designed to carry, the danger being that the wire will heat, burn its insulation, and either melt itself or set fire to any woodwork in its vicinity. The melting of a wire or of a fusible cut-out in a colliery with explosive gases would lead to disastrous results, and the probable loss of hundreds of lives, so that for mines of this class extraordinary precautions have to be taken.

In shafts and other places where the conducting cable is exposed to injury it should be armoured with steel strip or galvanised iron wire, and has the appearance of an ordinary winding rope. The different districts of the mine are fed by branch lines of cable running from the ends of the main shaft cables, and these smaller cables can be carried on wooden cleats or insulators nailed to the timbering of the level; and, if a little slack is allowed between each support, the danger of the cable being cut by an occasional fall of the roof or sides is minimised. For outside work the cables are supported on posts similar to the well-known telegraph wires, and may or may not be covered with insulating material. We have used both systems, but for lines passing through timbered country it is best to employ covered wires, as with their use the falling of a tree or branch across would not, of necessity, short-circuit the current by bringing the two wires into contact, which would, in all probability, be the case if bare wires were used.

We have spoken in general language only of an electric light installation, our object being to show that it is a matter which requires careful consideration before being adopted, and not one which can be entrusted to the foreman carpenter or fitter. The trained engineer can readily make himself acquainted with such of the rudiments of electric science as will prevent him from committing any grave errors in his installation, and there are for this purpose a large variety of text-books at his disposal. Once erected, and in working order, an ordinary mechanic or fitter can be now trained to look after the lamps and plant, and all will go well, provided he is kept within certain definite instructions and is made to obey the rules and regulations laid down by the makers for the care of the dynamo. A slight increase in the speed of the machine, for instance, will not only increase the brilliancy of the light in accordance with the desire of the man in charge, but will also burn the fusible cut-outs and throw the whole establishment into darkness, and so lead to disorder, possible accident, and certain loss of time. Forewarned is fore-armed, and if the manager will carefully get up the subject beforehand, and not rashly commit himself to it in the superabundance of his ignorance, he will save himself and the company no end of annoyance and expense, and be successful in his installation. If, on the other hand, he dashes wildly into it, trusting to luck and rule-of-thumb, he must expect to get into trouble, while the company must pay while he gains his experience.

CYANIDE LITERATURE.

WHEN a new metallurgical process of any importance is gradually developed there is always another concomitant development that proceeds on more or less parallel lines therewith, the study of which is always interesting from many points of view—we mean the literature of that process. It is nearly always the case that a process, more especially when it comes under the heading of chemico-technology, passes through three distinct phases of existence; in the first it is declared to be impossible, in the second to be impracticable, and in the third to have been long known to everybody. The cyanide process for gold extraction, certainly the most important metallurgical advance within the last decade, has been no exception to this rule. We can all remember its passage through the two former stages, and recent legal decisions, in spite of their late conclusion, entitle us to assert, with some kind of judicial support, that it has also duly passed through the ordeal of the third. Its development has been abnormally rapid, due, of course, to its special suitability to the ores of the Transvaal mines, with the expansion of which the growth of the process has had to keep pace. The first plant was erected in South Africa in 1891, and in 1894, or four years later, over 650,000 ounces were extracted by it in the Transvaal alone. Meantime, the literature of the subject also started into existence, and commenced to assert itself. There were a few scattered papers on the subject before 1893, in which year MACLAURIN published his admirable investigation into the chemistry of the method of extraction by cyanide. We know of no text-book on the general metallurgy of gold that contained any mention of this process previous to 1894; but within the last eighteen months there have been at least two that give some account of it, whilst a text-book devoted wholly to this one subject has been recently published by Mr. EISSLER. Rather abruptly, as it seems, within the last six months or so, there has been a perfect deluge of papers upon it in all scientific publications, periodicals, and journals, most of which merely repeat the same facts in slightly different language, whilst the studious reader wades through them in the hope of discovering sufficiently new matter to repay him for his labour. To what extent recent litigation is responsible for the increase of public attention to the subject, it is as easy to speculate as it is difficult to determine. Of course, a large class of readers of technical mining literature are men who are interested in mines merely as speculators or investors; all that they care to know is that a solution of cyanide of potassium dissolves gold out of ores and tailings, that this gold can be reprecipitated and thus won, and that the process is so cheap as to be applicable to comparatively poor material, and with this their curiosity is gratified. Such readers are amply provided for by popular descriptions in non-scientific periodicals, which can hardly be classed as technological in the stricter sense; but it is not for such that the large mass of really technical literature has been compiled, but rather for those who either are or may be engaged technically in carrying out the process. Those who are practically engaged in the work probably do not need to read much about so novel a process, as they can learn all they want to know by experience and experiment—always provided that they work intelligently and not as mere machines. A Kaffir may have been steadily shovelling tailings in cyanide vats for five years, and yet would hardly pass as an authority on the process on that account. Those practical men, however, who may want to know how others are working the cyanide process in different countries, or students who wish to acquire an insight into it theoretically, have to be considered; but it is quite possible that they are harmed instead of being benefited by a plethora of papers, and we often think that they must be embarrassed rather than assisted by the multiplication of such papers as the one of which we publish an extract in to-day's issue. It is difficult to see that the very exhaustive and complete description which we have recently been publishing from the pen of Dr. SCHEIDEL leaves much room just at present for papers by others. Dr. SCHEIDEL has brought German thoroughness and American acuteness to bear on the subject, and his monograph leaves little to be desired. Other valuable papers there have been, that have described every detail of the process in all its minutiæ, and we cannot help beginning to feel that the literature of the cyanide process is, if anything, overdone. To use an expressive Americanism, "it has been worked for all it is worth."

We are far from wishing to throw any doubt upon the value of technical literature in general even to the most severely practical of practical men. A book or paper on any technical matter written by one who really knows his subject from actual experience, is always of immense value, and the only pity is that such productions are so rare, principally for the reason that really practical men are mostly too busy to write, and are often absolutely incapable of writing well, because they have frequently been led to neglect such portions of educational training as have a purely literary value. Hence it comes that too many technical publications are the work of lecturers and teachers who have not infrequently little more than a bowing acquaintance with the subject they profess to treat of. But technical literature, in its highest form, when it embodies the results of many years' practical experience and patient observation and research, is sure of a welcome. Nevertheless, we repeat that in such a special case as that of the cyanide process, which has within so brief a period bulked so large before the public eye, it is easy to over-estimate the amount of information about it which those interested really desire, and we think that a timely protest may well be entered to prevent its being written to death, a consummation to be carefully avoided in the interests of the authors, their public, and of the process itself.

NOTES AND COMMENTS.

THE publication of the interim half-yearly report by the directors of the Champion Reef Gold Mining Company justifies the exceptional favour with which the shares have this week been regarded. It is gratifying to note that affairs at the mine look most promising, and that the developments during the six months have been of a highly satisfactory character. Captain Rowe's report shows that from north to south, with scarcely a break for the entire length of the property, a profitable lode has been opened up. In fact, Captain Rowe's report is full of interesting information, and assures us that in nearly every part of the mine the prospects are very encouraging. For instance, Garland's shaft has been sunk on a lode varying from 1 foot 3 inches to 5½ feet wide, of an average assay of 2 ounces 10 dwts. 21 grains; in Ribblesdale's shaft the prospects have considerably improved, one important feature being that the lode has "folded," and has developed into three distinct branches, all of which are good; Carmichael's shaft is being sunk in a rich lode of the width of 4 to 5 feet, of an average assay value of over 2 ounces to the ton, whilst in Rowe's shaft the lode has varied from 2 to 3 feet in width, of an average assay value of nearly 3 ounces of gold to the ton. As to the future, Captain Rowe says:—"The mine is opening up remarkably well, and there is no doubt but that we have a good future before us. We are increasing the reserves considerably. The lode, as far as seen at the deeper points, presents a most favourable appearance for a continuation of the good productive ground in depth."

IT is rather difficult to discover, in the reports of Monday's meeting of the Oceana Company, and the statement made thereat by Mr. Pasteur, even an apology for a reason why the capital of the company should be increased. Admittedly the directors have a sufficiency of money in hand for all contingencies likely to arise for some time to come, and yet, with this statement in their mouth, they have come to the shareholders with a proposal to issue an additional £100,000 worth of shares. The proposition is extraordinary, and the complacent acceptance of it by the shareholders is more extraordinary still. Everyone connected with European finance is probably aware that France is now eagerly assimilating all the South African shares of the better class that can be got, and from a hint dropped by the Chairman at Monday's meeting, it is probable that the bulk of the new issue will be absorbed in Paris. By the sale of these shares at a good price the directors may hope to make a few thousand pounds profit; but it is by no means easy to see that the shareholders will derive any very great advantage in the matter. In the, at present, rather vague probability of the company's paying another dividend it will simply mean that the capital upon which such distribution is made will be increased by a large proportion, and to that extent the shareholders will suffer. However, the step has been taken, and it merely remains for the company to wait patiently the effects of it.

THE sanguine anticipations of the directors and shareholders in Mainland Consols are apparently grounded on something much more substantial than mere imagination or fancy. According to the reports of more than one expert of reputation who has been called in to advise the directors, the property is considerable in magnitude and rich in quality, while it is evident that the present manager, who has earned the fullest confidence of the board of direction, believes thoroughly in the mine, and is doing his best to justify his faith by results. The assays of some of the ground brought away are of a figure conveniently placed between extremes. They are large enough to compel the satisfaction of the shareholders, and, at the same time, not what Mr. MacDermott might call sufficiently suggestive of the astronomical science in their magnitude to excite the incredulity of the sceptical and pessimistic. According to the latest advices, everything is in good trim at the mine, and matters are well in train for vigorous working, and to hasten the arrival of that happy hour when the Mainland Consols, it is hoped, will take its place among the dividend-paying properties on the List. There does not seem to be much loop-hole for criticism of an adverse character in the Chairman's speech. It is yet, perhaps, early days to speak with certainty respecting the capabilities of the mine, but the fact that the high opinion of the directorate is shared by the public at large—and more especially by the public of Australia, who may be supposed to be more in a position to judge of the merits of the enterprise than those living in more remote quarters of the globe—is shown by the appreciation in the purchase value of the shares, both at home and in the colony, which is already considerable.

THE *West Australian Gold Fields Courier* is complaining bitterly of the laxity of the West Australian Government in not looking after the welfare of the gold fields as it ought. We are greatly surprised at this, for we were certainly under the impression, from evidence offered us lately, that the Government was anxious to do everything in its power for the industry which has made the colony so conspicuous of late. The *Courier* words its complaint in these terms:—"The important finds of gold made recently between Coolgardie and Lake Darlot demonstrate the almost criminal neglect with which the field is being treated by the Government. With an overflowing treasury, and a revenue which is ever increasing at a surprising rate, there is absolutely nothing done by the Ministry towards assisting the development of the district, which, alone, is occasioning the rapid advancement of the colony. Beyond the erection of a Warden's Court there is scarcely a shilling of Government money being spent on the field, and the members of the works' staff are compelled to stand idly by with folded hands, and watch opportunities for carrying out necessary works pass unimproved." The writer then complains of the impossibility of the northern part of the district except to camels, owing to the want of water, whilst hundreds of men are waiting anxiously to go out and prospect the country. "Not a dam," he says, "is in course of construction on any part of the field, and no attempt whatever is being made even to keep the roads open, and thus enable the field to be prospected." Of course we are not in a position to judge whether this is exaggerated or no. We hope it is. All that can be said is that the Government of the colony has no clear conception of its opportunities, and of the incalculable consequences which may follow the lethargy of which it is accused. Public opinion, as expressed through its mouthpiece—the Press—can alone wake the Government up to its duties.

MINING operations in China, according to an account published recently in a German newspaper, present to the Western mind a curious jumble of harassing and tedious Imperial regulations, philosophic persistence on the part of the contractor, and dull contentment on the part of his men. Money plentifully scattered amongst the *entourage* of the Court seems to be the only way to secure the supreme privilege of a concession; after which the applicant, if successful, has to enter into a number of engagements as to the mode of working and the division of the profits. Miners in China are completely under the influence of a belief in the supernatural, and often look for guidance to the vacillations of the compass-needle and the positions of grave-stones, in their eyes an awful and sacred portent. The Chinaman's mode of working corresponds with the deliberation of his temperament. He is content with processes that have stood the test of years, and never goes gadding after any new thing. In this respect his workman is like him. Given the usual allowances of food and a wage, the bare mention of which would lash the British workman into an access of angry indignation, he works serenely on without indulging in

the dubious luxury of instituting comparisons between his own lot and that of his class in other countries. Under existing conditions, there is little chance of the introduction of English capital into the country to any extent. Jealousy of innovation, and the "outsider" who would introduce, is the prevailing passion of Emperor and people alike.

THE record of the past history of the Mashonaland Agency, which Mr. H. E. M. Davies gave, on Wednesday, as a sort of farewell statement on vacating the chair, is one with which any company of shareholders may well be satisfied, and when supplemented by the business-like and matter-of-fact statement of Mr. Stokes, the managing director in South Africa, should go a long way towards inspiring—or, rather maintaining, for it is already awakened—confidence in the enterprise. The latter is, in fact, of that invulnerable sort which acquires a multitudinous number of interests in carefully-selected enterprises, in the sure and certain hope that a majority of them, at least, will turn out well. The catalogue of investments given by Mr. Stokes as having been made on behalf of the company was a very impressive one, and more especially so because by far the greater number of them are situated in a country that is every day becoming more and more opened up, and whose vast resources, after having been long unknown and consequently neglected, are at length being turned to rich account. The fact that no dividends have yet been paid is one that admits of an easy explanation. Investments of the kind can only safely be made after the most careful investigations into their character, and such investigations require time to be satisfactorily performed. The Chairman hoped that the first dividend would be paid during next year, and that subsequently dividends would come regularly. Whether that be so or no, shareholders can well afford to wait. They have in their hands all the essentials of a financial success.

THE policy avowed by the Chairman at Wednesday's meeting of the London and West Australian Investment Company is one that will command the cordial assent of all the shareholders interested in the concern. West Australia is now one of the most promising fields in the world for an investment trust corporation of the kind under consideration, and if only the board exercise that caution, without which speculation is almost always fore-doomed to irretrievable failure, there seems to be no reason why they should not turn to prompt advantage the highly favourable conditions under which they are working. Some of the investments of the company—indeed, we should suppose a considerable proportion—are in land, and here, especially, time must necessarily do a great deal in favour of the company. The energy and enterprise which are being put into the work of opening up the vast tracts of hitherto almost unknown country which are in future to be the centres of a huge gold mining industry are so obviously in favour of a concern such as we believe the London and West Australian Investment Company to be that the shareholders have good ground for looking forward hopefully to the future. The successful flotation of the company and the good start as a working concern which it has made are matters upon which those interested in it may be heartily congratulated, and if only a part of the forecast given by the Chairman be verified, they will have no reason to be dissatisfied.

MR. E. D. OPPERT was quite correct in the assertion that the only testimony required as to the value of the West Australian Gold Concessions as a substantial investment is the fact that they have paid three quarterly dividends at the rate of 20 per cent. per annum, notwithstanding that the company has only been in existence eleven months. The amount of business passing through the hands of the directorate is of a very extensive character, and, so far, like a certain ancient mythological hero, everything they have touched has turned to gold. To adequately conduct these operations, however, at least a substantial working capital is required, and at the extraordinary general meeting of the company power was given to the directors to increase the capital by the issue of 67,500 new shares of £1 each. With the results of the past few months before them, it is difficult to see that the shareholders could have done other than give their consent to the proposal put before them by the directors. The board have fairly earned their confidence by past results, and if the company only continue its career as prosperously in the future as in the past, the shares will represent considerable value.

No time is being lost by the management of the Murchison United Gold Mines in commencing the work of development upon their property, and the records received up to the present go fully to confirm the statements made at the inception of the undertaking, and to show that the ground is sufficiently auriferous to form a very sound basis for future profits. The results quoted are of that sober character which, with men of cautious views, at once inspires confidence, while at the same time the uniformity is an earnest of regularly-maintained returns. That the executive in the colony are fully alive to the interests committed to their charge is shown by the way in which they have made haste to secure adjoining grounds of a valuable character, and this is in some sort a guarantee for the permanence of the company, without which richness itself would not be of great account. The continually recurring water difficulty has no interest for the shareholders in this company seeing that water has already been struck in two places on their property, while the experience gathered elsewhere in the neighbourhood lends colour to the belief that soon sufficient water will be met with for all mining purposes.

SCOTTY'S.—Captain Hodge has taken this mine in hand on behalf of the new company, and a few men are already employed, but it is the intention of the manager to sink a shaft forthwith to strike the underlie of the reef. No doubt there is a good future before this mine.—*New Zealand Herald.*

THE MINING MARKET.

FRIDAY EVENING.

The arrangement of the Settlement monopolising attention.—Aggravated anticipations of difficulties without fulfilment.—Africans closing good.—Other departments firm, but quiet.

THE shadow of the fortnightly Settlement has been over the Mining Market since we last wrote. We left the Kaffir Circus with a distinctly improving appearance, and a more cheerful tone after a harassing week. On Saturday the indications of the preceding day were confirmed, and a general slight advance was recorded in African descriptions. Confidence appeared to be fully restored, and there was none of the pessimistic chatter that was everywhere so rife a few days previously. Paris was sending renewed support, and higher prices came over from other Continental Bourses. The Land share section was quiet, with irregular movements. West Australians were firm, and there was a quiet business doing in Miscellaneous. On Monday the favourable tendency was maintained, though business was not on a large scale, pending the commencement of the Account on the morrow. The Westralian and Miscellaneous Markets shared the quiet equanimity of the Kaffir Circus. On Tuesday the adjustment of the Account began with a great show of strength, but there was a speedy change of front when it was found that the bull position was still of considerable proportions. Rates which opened high hardened as the day proceeded, and in the afternoon some very fancy charges were exacted. Under this influence, and owing to difficulties in arranging the carrying over of certain descriptions, a good deal of realisation took place, with the result that prices gave way, and the market assumed a very sick appearance. This, of course, was the signal for the rumour-mongers, who were quickly at work with categorical stories as to impending failures. It was evident that several of the wire-pullers of the market were in favour of a further reaction, and little effort was made to support quotations. The making-up prices showed a general decline from those ruling at the previous settlement, so that differences will be all in favour of the operators for the fall. Land shares were dull without serious losses. The continuation charges in the Westralian Market were generally lighter than a fortnight before, but this was not the case in Miscellaneous, where some heavy rates were charged on shares which should more properly have been taken off the market. On Wednesday brokers were mainly engaged in the carrying over in non-mining securities, in which dealings had considerably expanded. From sheer lack of support prices sagged away, and the attitude was openly one of expectation. This state of things was aggravated on Thursday, which, by virtue of its being Ascension Day, was observed as a holiday on the various Continental Bourses. London had, therefore, no extraneous aid to depend upon, and being engrossed with the details of the Settlement, Members allowed matters to drift. A satisfactory undertone pervaded the dulness, and little harm was effected upon prices.

This was the Stock Exchange Pay Day, and in spite of the many sinister rumours which had preceded the Settlement, not a single instance of default was announced. Of course, it is still possible that failures may follow, but the general appearance of the market gives colour to the assumption that matters have been arranged satisfactorily. When this is put beyond the region of doubt it seems probable that we shall have a marked rally in prices, though the approach of the Whitsuntide holidays, with Derby week intervening, must necessarily prove some drawback to a material increase in the volume of business. At the close Kaffirs are distinctly firm, and some appreciable gains have been scored on the day, despite the fact that many brokers have favoured their offices rather than the market, the transfer work being if anything heavier than before.

The scare, which was engineered amongst French mining investors last week by the distorted interpretation of the recent report on the South African industry, sent over by the Consul-General at Pretoria, has received a marked check this week. The *Gaulois* published a leading article declaring that the object of the French Government in discouraging the purchase of mining shares was to divert interest to its own issues. Mr. Francis J. Dormer, of Cape Town, now on a visit to Paris, has been extensively interviewed by various journals, and his emphatic contradiction of many of the adverse statements from Pretoria have had a reassuring effect among investors. On the other hand, it is reported that the French Chargé d'Affaires in London has compiled for publication a report on the nature of our market and the status of the companies in whose shares speculation is carried on. It is idle to forecast the terms of this rumoured manifesto and its consequences upon the attitude of Parisian operators.

South African Mines.

The widest fluctuations in this department have naturally been in those shares in which the speculative account has revealed abnormal conditions. East Rands, for instance, on which at the mid-May Account as much as 4s. 6d. contango was exacted, were once more the medium of some extravagant charges. The rate opened on Tuesday at 9d., but before the day was over as much as half-a-crown was paid. There is a rooted objection on the part of takers in of shares to be troubled with East Rands owing to the constantly recurring claims for bonus shares and other rights. On Monday the price was as good as 5½, but on Tuesday, under the influence of the Contango difficulty, there was a fall of ½ to 4 11/16. A game of see-saw has been in progress in the interval, and the last price — 4⅜ — shows absolutely no change on the week. Comets and St. Angelo, however, are appreciably better, both at 3½. Rand Mines stood at 31 on Monday, but broke away to 30¼ on Tuesday, and at one time to-day were no better than 29½. The last price is 29¾. Other Deep Levels have stood their ground very well, and in some instances have scored respectable gains. Roodepoort Deep, for instance, have put on ½ at 4, Gold Fields Deep ⅝ at 6¾, Nigel Deep ⅜ at 2¾, and Champ d'Or Deep ¼ at 1¾. The Barnato stocks show but trifling changes on balance, the most important move being a gain of ¼ in Buffels at 5½, the result of a specially strong market on Thursday, on the report that the reef has widened to 7 feet in the lowest level. New Croesus are ⅛ better at 2 1/16, whilst Mays, Primrose, and Glencairn are a shade easier. Knight's have been the medium of some extensive speculation. On Saturday cablegram intelligence was acted upon to the effect that a new reef had been struck in the main shaft, giving an average assay of 22 ounces of gold to the ton. On this the shares advanced to 8 "buyers," and on Monday as much as 9 was paid for the new account. There was a smart relapse to 8¼ on Tuesday, and the price has since fluctuated within a small compass round 8¾, at which the closing is firm. Jubilees are better to-day at 10¾, and Salisbury at 5⅞, after being 5 11/16, on the official announcement of the new company to take over the water right conjointly held by these companies for amalgamation with certain Rand Mines' claims. The Salisbury and Jubilee between them are to receive 70,000 shares. Village Main Reef have sympathetically gained ¼ at 6⅜. Modders were good on Monday, touching 16, but the shake-out has left them no better than 14¾, or ¼ easier on the week. A good deal of attention has been bestowed upon Van Ryns in connection with the official announcement of a subsidiary company to be called the Van Ryn North Exploration and Mining. This will have a capital of £170,000 in £1 shares, of which 70,000 will go to the parent company, the shareholders of which have the option of applying for a further 50,000 shares at 10s. premium. Van Ryn opened at 8¾, and rose to 9⅜ on Saturday. On Tuesday morning there was a further spurt to 9¾, but the price sagged away during the progress of the Account, and on Thursday business was done at 8½. The last price—8⅝—leaves matters *in statu quo*. A conspicuous fall is shown in George and May at 1 3/16, on forced sales by weak speculators. Metropolitans are 1/16 better at 2¾, and Randfontein have gained 6s. at 44s. 6d., closing to-night in the Street as quite the feature of the day. A strong upward move has taken place in Transvaal Gold, which close ⅜ better at 5 1/16. Sutherland Reefs have been heavily sold by insiders on the statement that Preference shares must be issued to help the company over its financial difficulties. The price at one time was as low as 5s. 6d., but to-day there has been a recovery to 9s., which still shows a loss of 2s. 6d. on the week. Other movements in Gold shares are for the most part unimportant. The fluctuations in Land shares have been within an even smaller compass. Chartered are finally ⅛ better at 3 1/16, in spite of extensive realisations and an exorbitant Contango. Pardy's Mozambique have been largely bought, and close 1/16 better at 2 3/16. Klerksdorps and Potchefstrooms, in which the speculative account is said to be very large, dipped under pressure, the former to 21s. 6d., and the latter to 20s., but each has shown gratifying recuperative power. Oceana are unchanged at 2¾, Bechuanalands ⅛ better at 2⅛, Mozambique 1s. better at 30s., and Hendersons ⅛ up at 3¾. Tati Concessions have been in demand, and close ⅛ better at 4. Gold Coast Developments have been well bought, and close hard at 7s. 9d. South African Gold Trust rose to 8¼ on Monday, on rumours of a big dividend, but leave off unchanged at 7¾. Consolidated Gold Fields are also unaltered at 9 1/16, whilst Johnnys Investments are ⅛ better at 4 1/16. Considerable animation has been seen in Diamond shares. Jagers are a clear point to the good at 10⅝ on dividend expectations, and De Beers have put on ⅝ at 21. St. Augustines have been extensively bought, and close 1s. 6d. up at 14s. 6d. on the announcement that Mr. Ward, of Wesselton fame, is joining the directorate.

West Australians.

There have been singularly few movements in Australians during the past week. Bayley's Reward rose to 12s. "buyers" on Saturday on the announcement of a good strike, but the last price is no better than 10s., or 1s. worse than last week. Austins have been up and down 1/16 or so, but close unchanged at 1. A good rise is shown in Coolgardie Syndicate which finish 4s. up on the week at 16s. 6d., on dividend rumours. Sherlaw Gold is hard at 11s. 3d., and Murchison Gold Fields a shade better at 7s. 9d. Mawson's Reward has lost half-a-crown at ⅞, and similar declines are shown in West Australian Exploration at 1⅞, Gold Fields at 3½, and Gold Estates at 1¼. Londonderry are 1/16 better at ⅜, and Golcondas have hardened to 1⅛. Great Boulder has maintained a masterly inactivity, whilst the doubtful dignity of scoring the greatest loss on the week has been won by Hampton Lands ⅛ down at 4½, Plains being 1/16 lower at 2½.

Miscellaneous.

There has been a considerable reduction in the volume of business in this department, and dealers have been openly averse to encouraging operators who were not in a position to take their purchases off the market. La Yesca Silver fell on Saturday from 8s. to 5s. 6d., but rallied to 7s. 6d. on Monday, on the publication of a return from the mine showing 1450 ounces of silver from 15 tons of low-grade ore. Broken Hill Props. are slightly easier at 45s., British are 6d. down at 7s. 6d., and Australians no better than 3s. 9d. Montanas are 6d. down at 12s. The New Zealand Gold group is easier, notably Kapanga, which marks a loss of 3s. at 11s. Hauraki is 6d. down at 11s. 6d. A 10 per cent. dividend on Waihi has not helped the quotation over 7. Slight declines, owing to absence of business, are marked in some Indians, Nundydroogs being 1/16 easier at 1⅛. Ooregum, however, are well maintained at 3 1/16, and Mysores have gained the turn at 3 1/16, with Champions 1/16 better at 4⅛. Very little has been done in Charters Towers descriptions, but quotations are fairly well supported. La Reine d'Or has given way 1s. 6d. to 16s. 6d. Wentworths continue flat, and show a net loss of 1/16 at 1/16, which is also the price of Aladdins. Tintos have once more led the way in Copper shares, closing 1/16 better at 16⅛, after drooping to 15⅞ on Saturday. Mason and Barry are ⅛ easier at 2⅞; but Tharsis has gained 1/16 at 5, and Capos and Copiapo each ⅛ at 2⅛. Namaqua is ⅛ harder at 1⅛. There are very few changes of importance in the lower-priced "rubbish," though the market here has dwindled, and dealings are on a more restricted scale.

STOCK EXCHANGE SETTLING DAYS.

Settling Days on the Stock Exchange are as follow:—

Consols, Wednesday, June 5.

STOCKS AND SHARES.

JUNE.

Ticket Days.	Account Days.
Tuesday, June 11	Wednesday, June 12
Tuesday, June 25	Wednesday, June 26

Contango Days for South African Market:—

Saturday, June 8	Saturday June 22

MR. RICHARD J. MIDDLETON, whose advertisement appears on the front page of this Journal, no longer acts on its behalf, having resigned his position as Business Manager.

HYDERABAD (DECCAN) COMPANY (LIMITED).—An extraordinary general meeting of the shareholders in the Hyderabad (Deccan) Company (Limited) was held yesterday, at Winchester House, for the purpose of considering and, if thought proper, passing resolutions reducing the capital of the company "by cancelling £30,000 thereof which has been lost, or is unrepresented by available assets." Mr. G. H. M. Batten, who presided, moved the resolution in a few sentences, remarking that the only difference the proposal would make to the ordinary shareholders was, that there would be a smaller capital to pay dividends upon.—Mr. B. Colvin seconded the motion, which was carried unanimously, and the proceedings terminated.

OTIS STEEL COMPANY (LIMITED).—At an extraordinary general meeting of the shareholders, held on Wednesday, at Winchester House, the resolution in favour of reconstruction previously arrived at was confirmed.

LATEST FROM THE MINES.

CABLEGRAMS AND TELEGRAMS.

AUSTIN GOLD MINES.—The following cable from the mines is to hand, dated May 21:—"Delay is caused by accidents, pumps, breakages. Crushing completed week after next."

ACHILLES GOLD FIELDS.—The following cablegram was received from the mine on the 3rd inst.:—"Have cleaned up after crushing 400 tons of quartz, gross yield 252 ounces." This represents the gold obtained from the quartz taken out during the month of April in going down on the lode to develop the lower levels. The managing director has already booked his passage for New Zealand, and on his arrival at the mine it is expected that with the additional water-power available much larger returns will be obtained.

ABBOTT'S.—A cablegram has been received stating that the developments are opening up splendidly. The directors hope to be in a position to report shortly that the machinery has been erected.

ALASKA MEXICAN.—Cablegram from Alaska reports the clean up for the month of April as follows:—"Period since last return, 30 days. Bullion shipped, $14,946. Ore milled, 6073 tons; sulphurets treated, 121 tons. Of bullion there came from sulphurets, $4570. Working expenses for period, $13,277."

ASSOCIATED GOLD MINES OF WESTERN AUSTRALIA.—The company's manager cables:—"Have mailed important information. Just struck rich reef, with very large quantity of payable stone, on Australia east."

BAYLEY'S REWARD CLAIM.—The following cablegram, dated the 20th inst., has been received by this company's London office from the head office at Melbourne:—"The extent is not known yet rich streak of gold ore. Have driven in lode 6 feet; have not yet got to the hanging-wall. Assay, 14 dwts. per ton, exclusive rich streak of gold ore." A further cablegram, dated the 21st inst. states:—"Lode driven 8 feet; no change in; have not yet got to the hanging-wall." The following cable has been received from the special correspondent of the Lewis Mining Investment Trust:—"Struck a rich body of ore 420 feet."

BAYLEY'S REWARD NO. 1 SOUTH.—The following cable dated 23rd instant, has been received by the company's London office from its head office at Melbourne:—"Fortnight's run, 145 ounces, 216 tons."

BLACKETT'S CLAIM.—Cable received from Mr. Leech, the manager, dated Coolgardie, May 21:—"Have recently discovered that where the pinch occurs in the vein, there are two veins on the property.—South shaft. The vein has been intersected by the shaft at a depth of 50 feet. The average width is 3 feet. The grade of the ore shows considerable improvement. Ore contains visible gold. By a level driven from the main shaft at a depth of 130 feet we have intersected vein. The vein is fully 7 feet in width. The quartz carries a little mineral. On the whole there is a decided improvement. Prospects are most encouraging."

BLACK SWAN.—The secretary has received the following cable from Melbourne:—"We have struck lode material; main shaft, carrying fine gold."

BRILLIANT.—Cablegram received from Charters Towers:—"Brilliant crushing, 2928 tons, 2366 ounces. Dividend No. 60, 4d. per share."

CRAVEN'S CALEDONIA.—The following cablegram has been received, giving the result of crushing, dated Charters Towers, May 21:—"305 tons yielding 455 ounces of gold."

DAY DAWN BLOCK AND WYNDHAM.—The following cablegram has been received from the general manager at Charters Towers, giving the result of the crushing for the fortnight ended the 18th inst.:—"Tons crushed, 966; yield of gold, 599 ounces; approximate value, £2100; fortnight's expenses, £1585."

DAY DAWN, P.C.—The following cablegram has been received from the manager at Charters Towers, giving the result of the crushing for the fortnight ended May 18: "No. 1 shaft, 26 tons, 15 ounces; No. 3 shaft, 168 tons, 236 ounces; tailings, 10 ounces; total, 261 ounces."

ELKHORN.—Bullion produced in the mill for the week, 10,000 ounces.

EMPRESS OF COOLGARDIE.—The directors have received the following cablegram from their agents in Australia:—"Empress struck rich body of ore."

GLADIATORS (Coolgardie Gold Fields).—Prof. Nicholas cables:—"Reef Golden King, 10 feet thick, assays 10 ounces."

GRASKOP.—The following has been received from the manager at Graskop, dated May 22:—"Have discovered another reef on the property; reef has an average assay value of ½ ounce per ton."

GREAT BOULDER PROPRIETARY.—The following cablegram has been received from the manager:—"Have deposited on account of third return 321 ounces. Will clean-up on Saturday."

KABOONGA.—The following is a copy of cablegram received from the manager at the mine:—"South-east drive, there is a marked change in south crosscut, washdirt black, water increased. Four washings give 95 dwts."—The board consider the increased water a favourable indication.

KINSELLA.—Cable messages have been received from Mr. Hewitson, the mine manager, reporting that a trial crushing has been made of 100 tons, taken pretty equally from the ore broken at three shafts, and that a yield of 125 ounces of retorted gold was obtained, the tailings assaying 5 dwts. per ton; and that the vendors of the property had previously extracted by dollying at the rate of 10 dwts. per ton from the same ore. He also reports that good progress is being made with the crosscut from main shaft at the 100 feet level.

KNIGHT'S (Johannesburg).—May 17. Phenomenally rich stone is being raised from the main shaft of Knight's, the average assays for the month showing 22 ounces per ton. The recent sharp rise in the shares is due to heavy buying from here on this information.

LA YESCA.—The following cablegram has been receive from Mr. C. E. Winwood-Smith:—"15 tons low-grade ore, 1450 ounces silver. Amalgam tailings will pay to work." The mill was, according to letter, started on April 22. The directors, therefore, presume that crushing has been delayed either by unforeseen circumstances attending the starting of a mill, or by preliminary trials to decide upon the proper treatment of the ore.

LADY LOCH.—The following cablegram has been received:—"Mine is daily improving. From the old shaft the western crosscut has been driven 52 feet, and the quartz is 7 feet wide. On the east of same shaft the drive is now in 45 feet, the quartz 3 feet wide. The new main shaft has been sunk to a depth of 91 feet."

MENZIES' GOLD REEFS PROPRIETARY.—The following information has been received by cable:—"Crusoe reef widened 6 feet; splendid gold across."

MINERVA.—Cablegram just received:—"Have struck the ore body in Minerva shaft at 60 feet."

MOODIE'S FORTUNA.—The following cable has been received from Johannesburg, under date April 29:—"The mine is looking exceedingly well, the chute on which we are now working being phenomenally rich."

MOUNT LEYSHON.—The Mount Leyson (Limited) have received the following cablegram, dated 21st inst. from their manager at Charters Towers, giving the fortnightly crushing:—"1600 tons crushed, 273 ounces of gold; 40 stamps mill ran 11 days; profit, £100."

MOZAMBIQUE.—Receipts for month of February last amounted to 10,838·317 reis, or at £220 per conto of reis £2383.

NANNINE.—A Dalziel cablegram says:—"At the Nannine Mine 337 tons of stone have been crushed, yielding 1015 ounces of gold."

NEW ZEALAND JUBILEE.—From telegraphic advices received from the mine the board is able to announce that ore from the Alexandra Gully is now being crushed, that the cyanide plant is approaching completion, and that satisfactory results are expected. At the lowest level the reef is 12 feet thick.

NEW ST. AUGUSTINE.—A cablegram received from the mine states:—"2400 loads yielded 133 carats."

NEW RAND.—Mr. R. H. Cavill, the general manager in South Africa, cables:—"Ore from the mine averaged for the last seven days 8 dwts. per ton; the reef is now wider than the drive."

NORTH KAPANGA.—A cablegram dated Coromandel, May 22, states that the crosscut tunnel has been driven 60 feet, making in all 660 feet.

ORIENT.—The following cablegram has been received, dated Cairns, Queensland, 18th inst.:—"Have driven 10 feet during the week; everything looks well."

OTTOS KOPJE DIAMOND MINES.—The following cable, dated 20th inst., has been received from Mr. William Evans, a director of the Ottos Kopje Diamond Mines (Limited), who is on a visit of inspection at the mines:—"Have tested machinery; will start work next Thursday. Delays partly caused by faults in design, partly by mistakes in erection."

PILBARRA GOLD FIELDS.—The manager of the company, Mr. Herbert P. Pearse, has arrived in Western Australia. The directors have received a cable as follows:—"Queen crushed 60 tons 111 ounces.

RANDFONTEIN ESTATES.—Cable information has been received at the London office of the Randfontein Estates Gold Mining Company that the reef has just been struck on mynpacht No. 206, assaying 2 ounces 5 dwts. per ton, about 20 feet below the surface, and in bore-hole at a depth of 960 feet assays give 6 ounces 3 dwts. per ton.

SALISBURY REEF.—A cablegram has been received from the managing director at Salisbury announcing the arrival at the mines, on the 19th inst., of Mr. Elliot, the lately-appointed manager, and stating that work will be commenced immediately.

SILVER KING.—The following cable has been received from Mr. Edwards, manager at the company's mines:—"First half of May, ore crushed, 1000 tons; silver produced, 11,000 ounces."

SPITZKOP FARM.—A telegram, dated May 22, advises:—"Cyanide works have been started."

SUTHERLAND REEF.—Cablegram dated May 20:—"Crushed 840 tons to May 14; estimated value bullion, £910."

UNITED AFRICAN LANDS (Eikeloom Collieries).—The manager, writing under date April 26 last, reports having sold 100 tons of coal to the Sheba Mine, and 100 tons to the German East Africa Steamship Company, at Delagoa Bay. This in addition to the usual monthly contracts.

VICTORIA ASSOCIATION (Charters Towers).—The following cablegram has been received:—"Fortnight's crushing, 280 tons, yielded 534 ounces of gold."

VIOLET CONSOLIDATED.—The following has been received from Johannesburg by last mail:—"The result of crushings from September, 1894, to March, 1895, was 5333 tons for 1629·79 ounces, being 6·11 dwts. per ton, this return not taking into consideration the gold in the tailings, which showed an average assay of 4·25 dwts. per ton."

THE METAL MARKETS.

LONDON METAL MARKET.

THE METAL MARKET, LONDON, MAY 24.

Copper.

GREAT efforts are again being made to bring about an arrangement between American and European producers, but after the many manipulations of the speculative market caused by the previous rumours, the talk of the fresh attempts is not making much impression, excepting on a few outsiders, who, as rule, are saddled by some of those manipulators with a quantity of copper at the top values of the market. Whether an understanding is or is not arrived at, the present price of copper is not a high one, and the consumption in America and also in Europe is good. There is therefore, no reason why we should not have good markets, especially if those manipulations in connection with the proposed arrangement should be dropped once for all. The G.M.B. market opened this week with a smart recovery to £43 10s. s.c., and £44 three months G.M.B's.—*i.e.*, a rise of about 25s. per ton. Sellers becoming more numerous at this high level, values declined to £43 3s. 9d. and £43 10s. respectively. The day's turnover amounted to 1500 tons, and the tone remained quite steady at the easier values. On Tuesday 1350 tons were done whilst the value eased off to £43 s.c., and £43 7s. 6d. three months. Wednesday's turnover was only 850 tons, but up to £43 3s. 9d. was realised for cash, and up to £43 11s. 3d. for three months, the close being at 1s. 3d. less. Yesterday we had a firmer market, s.c. improving to £43 7s. 6d., and three months to £43 17s. 6d., whilst the business done amounted to 850 tons. To day after sharp cash transactions at £43 17s. 6d., and three months at £44 to £44 7s. 6d., with a turnover of 1650 tons, the market closes firm at £43 6s. 3d. to £43 7s. 6d. s.c., and £44 3s. 9d. to £44 5s. three months. The business in consumers' copper has been only on a moderate scale, but prices have improved.

Tin.

In sympathy with the stronger tone in copper, this market also was much firmer at the commencement, and business took place in cash Straits up to £67 2s. 6d. and three months up to £67 12s. 6d.—*i.e.*, at about 20s. per ton above Friday's closing price. The day's business totalled about 275 tons. A like quantity was done on Tuesday, when—as in copper—there came a relapse, s.c. tin going down to £66 2s. 6d. and three months to £66 10s. Wednesday's turn-over also amounted to 250 tons, and resulted in a further decline—viz., to £65 10s. s.c. and £65 15s. three months—but the latter position then rallied to £66, and spot to £65 12s. 6d. On Thursday 250 tons changed hands at £65 10s. to £65 17s. 6d. for s.c., and £65 15s. to £65 17s. 6d. for three months, whilst to-day we had a very limited business at £65 12s. 6d. and £65 11s. 3d. s.c. and £66 three months, the two positions closing respectively at £65 10s. to £65 12s. 6d. s.c., and £65 17s. 6d. to £66 three months. In the Dutch market, the morning prices (telegraphed) were as follows for Billiton:—Monday fl. 40½ s.c., Tuesday fl. 40½, Wednesday fl. 40, Thursday no market, Friday fl. 39½, with three months Billiton at fl. 40½, and Banca s.c. at fl. 40¾.

Pig Iron.

Scotch shipments last week were 8768 tons, or 3448 tons above those of the same week of 1894. There was a steady and firm market during Monday, Tuesday, and Wednesday, with business in s.c. Scotch warrants at 43s. 1d. to 43s. 5½d. On Thursday there was a public holiday in Scotland, and to-day, after business in s.c. up to 43s. 7½d., the market closed steady at 43s. 7d. buyers, with Middlesbrough and hematite quoted respectively 35s. 4d. and 43s. 10d.

Lead

opened very steady, and has developed considerable firmness at the close, which is at £10 6s. 3d. for soft foreign, and £10 7s. 6d. for English.

Spelter

opened firmer with £15 asked by sellers. Later £14 17s. 6d. would have been taken, but we close very strong, and with a considerable rise—viz., at £15 2s. 6d. ordinaries, and £15 5s. specials.

Antimony

is firmer at £31 10s. to £32.

Quicksilver

steady, and without new feature at £7 5s. firsts, and £7 4s. seconds.

The following are to-night's (May 24) prices of metals:—

	£ s. d.	£ s. d.
Copper.		
Tough cake and ingot	46 15 0	47 5 0
Best selected	47 15 0	48 5 0
Electrolytic Copper		Nominal.
Sheets and sheathing	——	53 0 0
Flat bottoms	——	56 0 0
Chili bars	spot, & 3 months respectively 43 16 3	44 3 9
Good merchantable,		
Copper tubes, seamless	——	0 0 7¼
Alloys.		
BRASS: Wire	——	0 0 5¼
,, Tubes (solid drawn)	——	0 0 6
,, Sheets	——	0 0 5¾
PHOSPHOR BRONZE: Alloys II.	——	78 0 0
,, ,, III. or Cog Wheel Brand	——	81 0 0
,, ,, VII.	——	83 0 0
,, ,, XI.	——	78 0 0
,, ,, Vulcan brand A1	——	72 0 0
DURO METAL	——	73 0 0
BULL'S METAL	——	65 0 0
Ferrobronze (Vivian's).		
Ingots per lb.	0 0 5¼	——
Ordinary sheets, plates, bolts and bars	0 0 6½	——
Screw bolts and nuts	0 0 8	——
Pump rods, plain	0 0 7	——
,, finished	0 0 10	——
DELTA METAL: No. 4 (per ton)	——	——
,, Sheets and plates (per lb.)	——	——
,, Bars, round, square, flat (per lb.)	——	——
,, ,, hexagon (per lb.)	——	——
Tin.		
English, ingots, f.o.b.	70 0 0	70 10 0
,, bars	71 0 0	71 10 0
,, refined	72 0 0	72 10 0
Straits, spot and 3 months respectively	65 12 6	66 0 0
Australian spot, and three months respectively	66 7 6	66 15 0
Banca ,, (in Holland)	66 7 6	68 10 0
TIN PLATES: Charcoal, best quality per box	0 14 0	0 16 6
,, ,, ordinary	0 11 9	0 13 9
,, Coke, best quality	0 10 0	0 10 3
,, ,, ordinary	0 9 6	0 10 0

These prices of tinplates are f.o.b. at Swansea; at Liverpool 6d. per box more.

Iron.		
Pig, G.M.B., f.o.b., Clyde, spot	——	2 3 7½
,, Scotch pig, No. 1 Gartsherrie	——	2 10 6
,, ,, Coltness	——	2 12 6
,, ,, Clyde	——	2 8 6
,, ,, Govan	——	2 5 0
Bars, Welsh, f.o.b. Wales	——	4 17 6
Plates ,, ,,	——	5 0 0
Bars, Staffordshire, at works	——	4 17 6
Sheets ,, ,,	——	6 0 0
Plates ,, ,,	——	5 0 0
Hoops ,, ,,	——	5 10 0
Ship plates, Middlesborough	——	4 16 3
STEEL: English spring	——	10 0 0
,, ,, cast	——	42 0 0
,, Rails at works, according to section	3 10 0	4 15 0
Lead.		
Spanish or soft foreign	——	10 6 3
English pig, common	——	10 7 6
,, L.S.	——	10 15 0
,, sheet	——	11 7 6
,, bar lead	——	11 7 6
,, pipe	——	11 17 6
,, red	——	12 10 0
,, white	——	18 5 0
,, patent shot	——	14 10 0
Spelter.		
Silesian ordinary brands	——	15 2 6
,, special brands	——	15 5 0
English Swansea	——	15 15 0
Sheet Zinc	17 12 6	17 17 6
Antimony.		
Antimony	31 10 0	32 0 0
Quicksilver.		
Flasks, 75 lbs. warrants	7 4 0	7 5 0
Ore, c.i.f., U.K. ports	per unit.	
1st quality, 50 per cent. and upwards	0 0 10	0 0 10½
2nd ,, 47 per cent. to 50 per cent.	0 0 9	0 0 10
3rd ,, 40 ,, 47 per cent.	0 0 7½	0 0 9
Aluminium.		Per lb.
98-99½ per cent. (guaranteed 98 per cent. min.)	in ingots (1 cwt. lots)	0 1 7
do do	(1 ton lots)	0 1 6
Nickel.		
98-99 per cent. guarantee	0 1 3	0 1 4

WASHINGTON NICKEL ORE.—The first nickel ore having a commercial value to be shipped to the smelters from this state comes from the Ontario Mine on Nigger Creek, a tributary of the Wenatchee river, near the town of Leavenworth on the Great Northern railway. The ore not only has a commercial value, but the returns are so flattering, that there is ample margin for a handsome profit to the owners of the mine. The returns have been looked for with no little anxiety, as on the smelter returns of the carload depended the future of the whole camp where a large number of locations have been made. The owners, however, were well convinced that that would be a fair profit in the ore but were very much surprised that it should run so high. Following are the returns as taken from the smelter's statement:—

Metal:	Per cent.	Lbs. per ton.	Value per lb.	Total per ton.
Nickel	8·10	162	$ ·32	$51·84
Cobalt	2·75	55	1·70	93·50
Copper	2·15	43	·09¾	4·19
Grand total				$149·53

Should the ore have a value of but half the estimate—and we believe the smelter at East St. Louis has made the statement that it was worth but $96 per ton—it would still leave a good margin for the miners. If reports are true as to the area of the nickel belt Washington will soon have nickel mines which will rival those of Sudbury, Canada, which are to-day the most important on the Continent. Preparations are being made for rapid and extensive development of the Ontario and other mines in the district which is justified by the flattering returns; and with this mineral added to the gold, silver, copper, and coal which is in the vicinity, to say nothing of the iron, Leavenworth will soon be an important mining centre. Our information is furnished by A. S. Lindsay, editor of the *Leavenworth Journal* and we believe it to be absolutely reliable. The total cost of mining transportation and smelting is $41 per ton, leaving a profit of $97·47 per ton to the owners. —*Northwest Mining Review.*

FRENCH MINING SPECULATION.—The *Gaulois* states that the French Charge d'Affaires in London has submitted to the Government a report on the recent investigations made by him respecting gold mining companies, and that it is the intention of the Government to publish the report for the guidance of French speculators.

"THE MINING JOURNAL" SHARE LIST.

ABBREVIATIONS AND REFERENCES.—Th following are the significations of the abbreviations and references which occur in the Share List:—*Ay*, Antimony; *A*, Arsenic; *Bl*, Blende; *Bx*, Borax; *C*, Copper; *D*, Diamond; *G*, Gold; *I*, Iron; *L*, Lead; *M*, Mundic; *N*, Nitrates; *P*, Phosphates; *Q*, Quicksilver; *R*, Ruby; *S*, Silver; *S-l*, Silver-lead; *Sul*, Sulphur; *T*, Tin; and *Z*, Zinc. * in the "Amount of Share" column of British Mines signifies that the mine is conducted on "Cost Book" principles; ‡ in the "Head Office" column of African Mines signifies that the address given is not that of the head office, but of a sub, or transfer office; and †, following the names of African Mines, signifies that they are subject to the Limited Liability Law of the South African Republic.

* The following is by far the most complete and comprehensive list of mines, in whose shares business is being currently transacted, published. Additions will be made from time to time as occasion requires. Every effort is made to ensure accuracy, and Secretaries of Companies, Share Dealers, and our readers generally, are cordially invited to co-operate with us to this end, by notifying us of any errors that may at any time occur. We desire it to be understood that, while our Share List will almost invariably be found correct, we do not hold ourselves responsible for any loss or inconvenience that may arise from possible inaccuracies.

BRITISH MINES.

Name	Closing Price, May 24, 1895	Closing Price, May 17, 1895.	Am't. of Share	Latest Dividend	Called up Per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office
			£ s.		£ s. d.			
Blue Hills ....*CT*	5/ 7/6	5/ 7/6	*	2/- May,'81	5 19 5	5,353	Cornwall	Camborne.
Botallack ....*T*	—	—	*	—	51 4 6	1,880	Cornwall	St. Just.
Carn Brea ....*T*	2¼ 2¾	1¼ 1⅝	*	2/6 Dec.,'93	22 8 5	6,000	Cornwall	Carn Brea.
Cook's Kitchen ..*T*	10/- 11/-	5/ 10/-	*	—	35 15 10	4,900	Cornwall	Camborne.
Devon Gawton *CA*	par ¼ pm.	par ½pm.	1 0	—	0 12 6	25,000	Tavistock	8, Finsbury circus.
Devon Gt Cons. *CA*	1⅛ 1⅜	1⅛ 1⅜	5 0	3/- Nov. '94	2 0 0	10,240	Devon ...	8, Finsbury circus.
Dolcoath ....*T*	51 51½	48	*	12/6 Apr.,'94	9 12 6	4,700	Cornwall	Camborne.
Drakewalls *CTM*	—	—	0 5	—	0 2 0	61,856	Cornwall	Dashwood House.
East Halkyn.....	20/- 25/-	20/ 25/	1 0	—	0 12 6	12,000	Flintshire	67, Lord St., Liverpl.
East Pool ....*AT*	6 6¼	4⅞ 5⅛	*	1/6 Sept,'94	0 9 9	6,400	Cornwall	Illogan.
Gawton ....*CA*	—	—	2 10	—	2 7 0	12,000	Devon ..	20, Great St. Helens.
Great Laxey....*L*	1¼ 1¾	1⅛ 1¾	4 0	5/- Apr.,'92	4 0 0	15,000	I. of Man	Douglas, Isle of Man.
Green Hurth ...*L*	1/6	1/6	1 0	-/6 June '89	0 19 0	32,000	Cmberlnd	Newcastle.
Halkyn ......*L*	9 10	9 10	1 0	—	1 0 0	10,000	Flintshire	Chester.
Do. Dis. Mn. Drain	8½ 10½	8½ 10½	10 0	4/- Mar. '95	10 0 0	10,000	Flintshire	CornEx.Cmb, Chestr.
	—	—	1 0	6 p c Aug. 94	1 0 0	3,000	Flintshire	67, Lord St., Liverpl.
Isle of Man ....*L*	3⅞ 4⅜	3⅞ 4⅜	5 0	1/6 Dec. 94	5 0 0	11,000	I. of Man	Chester.
Killifreth ....*T*	10/- 11/	5/ 10/-	*	1/6 Nov.,'94	5 11 6	6,000	Cornwall	Truro.
Leadhills ....*L*	⅞ 1⅛	15/- 20/	6 0	3/- Sep. '92	6 0 0	20,000	Lanarksh.	30, Finsbury-circus.
Llanarmon	par	par	1 0	—	1 0 0	11,990	Denbigh	8, Werburgh Chmbrs
Llanarmon	par	par	1 0	—	0 15 0	3,790	Flintshire	Chester.
Levant ....*CT*	4¼ 5	4¾ 5	*	4/- Nov.,'94	11 9 6	2,500	Cornwall	Penzance.
Lovell ....*T*	—	—	*	1/3 Nov.,'91	1 16 7	7,165	Wendron	3, Gt. Queen-st., S.W.
Minera....*L*	—	—	5 0	5/6 Mar. '90	5 0 0	9,000	Denbghsh	Minera, N. Wales.
Nenthd&Tndle.*LZ*	3/6	3/6	1 0	6% Feb.,'91	0 18 0	48,816	Nthumbld	Newcastle-on-Tyne.
NewCooksKitn.*TC*	—	—	*	—	10 18 3	4,900	Cornwall	Camborne.
New Minera	—	—	1 0	1/- Oct.,'92	1 0 0	30,000	N. Wales...	6, Queen-street-place.
North Hendre	—	—	2 10	8 p c year 82	2 10 0	11,854	Flintshire	11, Nwgt. st., Chstr.
Parc ....*LZ*	—	—	1 0	—	1 0 0	5,000	Llanrwst...	Billiter sq. buildings
Phoenix United *TC*	1/6 2/-	1/6 2/	*	1/- Mar. '90	7 4 6	10,665	Cornwall	Liskeard.
Polberro ....*T*	1 1¼	15/ 20/	*	—	3 7 9	18,000	Cornwall	37, Walbrook.
Rhosemor ....*L*	par	par	1 0	10 p c Sept. 91	1 0 0	1,000	Flintshire	CornEx.Cmb.Chestr.
Rhosemor ....*L*	par	par	1 0	—	0 19 0	18,000	Flintshire	CornEx.Cmb.Chestr.
So. Condurrow *TC*	2/6 7/6	2/6 7/6	*	3/6 Apr. '93	7 17 6	6,123	Cornwall	20, Great St. Helens
South Crofty *TA*	7/6 12/6	7/6 12/6	*	—	17 7 6	6,120	Cornwall	Pool, Cornwall.
S. Frances Untd. *T*	16/6 17/6	10/- 11/-	*	—	2 7 6	6,000	Cornwall	Redruth.
South Halkyn	par	par	1 0	—	1 0 0	10,000	Flintshire	8, Werburgh Chmbrs
South Halkyn	par	par	1 0	—	0 7 0	30,000	Flintshire	8, Werburgh Chmbrs
Talacre	par	par	1 0	—	0 15 0	20,000	Flintshire	81, Forgate st., Chstr
Tincroft ....*T*	7¼ 7¾	7¾	*	2/- Aug. '94	15 7 6	6,000	Cornwall	Carn Brea.
Weardale ....*L*	8/9	8/9	4 0	1/3 Oct. '90	1 10 0	50,000	Durham...	3, Lombard-court.
West Frances ...*T*	⅛ 1	8/6 9/6	—	2/6 May,'89	17 1 7	6,144	Cornwall	Camborne.
West Kitty ....*T*	6¼ 6½	6⅜	*	2/- Dec,'94	1 2 0	6,000	Cornwall	37, Walbrook.
Wheal Agar ..*TA*	2/6 7/6	2/6 7/6	*	2/6 Aug.'88	23 15 2	6,000	Cornwall	Redruth.
Wheal Basset ...*TC*	1⅜ 1⅜	35/	*	10/- Apr.'88	12 3 0	6,144	Cornwall	Redruth.
Wheal Friendly..*T*	-/6 1/-	-/6 1/-	*	—	0 12 9	10,000	Cornwall	110, Cannon-st., E.C.
Wheal Grenville *T*	12 12¼	12¼ 12½	*	2/6 Nov. '94	18 2 0	6,000	Cornwall	7, Union-court, E.C.
Wheal Kitty....*T*	2/ 4/	2/- 4/-	*	3/- Mar. '88	4 5 6	8,590	Cornwall	Truro.
Wheal Metal &F.*T*	1/- 1/6	1/- 1/6	*	—	0 13 9		Cornwall	14, Broad-street.

AUSTRALIAN AND NEW ZEALAND MINES.

Name	Closing Price, May 24, 1895	Closing Price, May 17, 1895.	Am't. of Share	Latest Dividend	Called up Per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office
Abbotts ....*G*	⅝ ¾	⅝ ¾	1 0	—	0 17 6	67,000	M'rchison	17, Old Broad st.
Achilles Gld Fld.	4/ 4/6	4/- 4/6	2/6	—	0 2 6	642,456	N.Zealand	Poultry.
Aladdins Lamp *G*	⅝ ¾	11/16 13/16	1 0	1/- May '95	1 0 0	100,000	N S.Wales	4-6, Throg. Avenue.
Assoc. Gold Mines	⅝ ¾	⅝ ¾	1 0	—	1 0 0	375,000	Coolgardie	20, Bucklersbury
Austin....*G*	⅞ 1⅛	1 5/16 1 7/16	1 0	—	1 0 0	60,000	Murchison	23, College hill, EC
Australasian ....*G*	4/3 4/9	4/3 4/9	1 0	-/6 Mar.,'92	1 0 0	210,000	Queensland	6, Queen-st. place
Australian ....*C*	—	—	20 0	1/6 July '94	7 7 6	18,315	S. Austral.	15, Old Jewry Chbrs
Aus. Bro. Hill Con.	3/9 4/3	4/3 4/9	1 0	1/- June,'91	1 0 0	537,138	N.S.Wales	Dashwood House.
Baker's Creek ...*G*	17/6 22/6	17/6 22/6	1 0	1/- May '95	0 17 6	100,000	N.S.Wales	Hillgrove, N.S.Wales
Bayley's Reward *G*	9/6 10/6	12/- 13/	1 0	-/4 Dec. 94	1 0 0	480,000	Coolgardie	F'sb'y. H. Bl'mf'ld St.
Big Blow ....*G*	⅝ ⅝	9/16 11/16	1 0	—	0 15 0	100,000	Coolgardie	Blomfield Ho., E.C.
Blackett's Claim *G*	½ ⅝	½ 9/16	1 0	—	1 0 0	60,000	Coolgardie	Winchester House
Blue Spur & G. G.	-/6 1/-	-/6 1/	1 0	—	1 0 0	80,098	N.Zealand	6, Gt. St. Helens'
Bonnie Dundee *G*	11/16 ¾	15/6 16/6	1 0	—	0 18 6	120,000	Queensland	3-5, Gracechurch-st
Brilliant....*G*	¾ ⅞ xd	17/ 19/	2 0	-/4 May '95	2 0 0	250,000	Queensland	Charters Towers.
Brilliant Block...*G*	1 13/16 2 1/16	1 13/16 2 1/16	2 0	-/6 Apr. 95	2 0 0	250,000	Queensland	3, Gracechurch-st.
Brilliant, St. Geo.	1⅜ 1½	1⅜ 1½ xd	0 10	6d. May '95	0 6 3	72,000	Queensland	Charters Towers.
Brit. Brok. Hill *S*	—	—	1 0	—	1 0 0	—	N.S.Wales	Dashwood Ho., E.C.
Brit. Broken Hill	—	—	0 8	—	0 8 0	—	N.S.Wales	Dashwood Ho., E.C.
Broken Hill Prop.	2 5/16 2 9/16	2¼ 2⅜	0 8	1/- Apr. '95	0 8 0	960,000	N.S.Wales	Dashwood Ho., E.C.
Cashman Bril.... *G*	⅝ ¾	⅝ ¾	1 0	—	1 0 0	60,000	Coolgardie	Winchester House.
Carrington....*G*	8/- 9/-	10/ 11/	12/6	—	0 12 6	100,007	Queensland	9, Tokenhouse Yard.
Con. G. M. of W.A.	⅞ 1	⅞ 1	1 0	—	0 12 6	90,000	W.Austral	14, Hill st., Edinboro'
Coolgardie ....*G*	-/9 1/-	-/9 1/-	0 2	—	0 0 6	40,000	Coolgardie	Winchester House.
Coolgardie(Shrlws)	16/ 16/6	13/ 14/	1 0	—	0 6 0	—	Coolgardie	Broad Street Avenue.
Craven's Cal. ... *G*	3/6 4/6	3/6 4/6	0 6	-/3 June 94	0 4 8	100,000	Queensland	30-1, S. Swithin's-le.
Crown Bayley's..*G*	1/16 ⅛ pm	1/16 ⅛ pm	1 0	—	0 10 0	80,000	Coolgardie	Bishopsgate Ho. E.C.
Cumbrind (New)*G*	3/3 3/9	4/ 5/	1 0	2/6 Dec.,'87	0 19 0	184,890	Queensland	Blomfield House.E.C.
DayDawn B.&W.*G*	11/- 12/-	—	1 0	-/6 Mar. 93	1 0 0	498,400	Queensland	3-5, Gracechurch-st.
Day Dawn P. C. *G*	6/3 6/9	¾ ⅞	1 0	-/6 Apr.,'92	1 0 0	490,000	Queensland	Winchester Ho., E.C.
Eaglehawk....*G*	1/6 2/-	1/6 2/	1 0	—	0 19 9	120,000	Victoria...	31, Lombard-street.
Empress Coolge. *G*	¼ ⅛ dis.	¼ ⅛ dis.	1 0	—	0 10 0	90,000	Coolgardie	2, Tokenhouse bldgs
Eng. & Aus.Cop.*Cu*	1/16	1/16	2 0	2% 1883	1 17 6	70,000	S. Austral.	136, Palmerston-blds
Frederick the Gt *G*	—	—	1 0	—	1 0 0	125,000	Victoria...	St. George's House.
Glenrock ....*G*	1/3 1/9	1/3 1/9	1 0	—	1 0 0	225,000	N.Zealand	3-5, Queen-st. E.C.
Golconda ....*G*	1 1⅛	1 1⅛	1 0	—	1 0 0	68,088	Murchison	Winchester House
Gold Estates........	1 5/16 1 7/16	1 7/16 1 9/16	1 0	—	0 10 0	80,000	W. Austral	42, Gresham House.
Great Boulder ...*G*	1 13/16 1 15/16	1⅞ 1⅞	1 0	—	1 0 0	119,380	Yilgarn ..	3, Gracechurch st.
Great Coolgardie...	5/16 7/16	5/16 7/16	1 0	—	0 15 0	85,000	Coolgardie	3. Budge Row.
Great Fingall Rfs.	1⅞ 1⅜	1⅞ 2⅛	1 0	—	1 0 0	175,000	Kurnalpi	Broad Street House.
Golden Gate....*G*	2/3 2/9	2/3 2/9	0 10	—	0 10 0	150,000	Queensland	9, Tokenhouse Yard.
Hampton Lands...	4⅛ 4¼	4⅜ 4⅞	1 0	10/- Nov. '94	1 0 0	64,075	Coolgardie	1, Whittington Avue
Hampton Plains...	2⅛ 2⅜	2⅛ 2⅜	1 0	—	0 4 0	350,000	Coolgardie	29, S. Swithin's lane
HamptonPlainsEx	9/3 9/6	8/- 8/6	1 0	—	0 18 0	180,000		Suffolk House, E.C
Hannan's BrwnHll	1 1⅛	1¼ 1⅜	1 0	—	1 0 0	65,000	Coolgardie	Broad Street House.
Hauraki.... *G*	11/6 12/6	12/ 13/-	2/6	—	0 0 6	250,000	Coromndl.	Dashwood Ho.; E.C.
Kaboonga ....*G*	4/ 4/6	4/ 4/6	0 10	—	0 9 9	500,000	Queensland	70-71, Bishopsgate st.
Kangarilla ....*S*	6/9 7/3	6/9 7/3	1 0	—	1 0 0	88,275	So. Austral	68, Coleman-street.
Kapanga....*G*	⅝ 11/16	⅝ 11/16	1 0	-/6 Jan. '91	0 19 6	250,000	N.Zealand	9, New Broad-street.
Kilkivan....*G*	—	—	1 0	—	1 0 0	81,392	Queensland	4, Coleman-street.
Kinsella ....*G*	1 1⅛	1⅞ 2	1 0	—	1 0 0	80,000	Murchison	33, Broad-st. Avenue
Kurnalpi....*G*	11/ 12/	11/ 12/	1 0	—	—	—	Coolgardie	Throgmorton House
Lady Loch......	⅝ ⅝	7/16 9/16	1 0	—	0 10 0	70,000	Coolgardie	9, Tokenhouse Yard.
Lady Mary Amalg.	1 5/16 1 7/16	1⅜ 1⅜	1 0	—	1 0 0	46,000	Murchison	Blomfield House.
Lindsay	3/16 1/16 dis.	3/16 1/16 dis	1 0	—	0 10 0	65,000	Coolgardie	Copthall House
Londonderry..... *G*	9/16 11/16	⅝ ¾	1 0	—	1 0 0	467,000	Coolgardie	3, Gracechurch-st.
L.& W. Aust. Expl.	1⅞ 2	1⅞ 2⅛	1 0	20 p.c. Dec. '94	1 0 0	100,000	W. Austral	[illegible] Street Ho.
Mainland Cons. *G*	3/16 5/16 pm.	1/16 3/16 pm.	1 0	—	0 15 0	150,000	Murchison	6 [illegible] Broad Street
Mawson'sRewrd.*G*	¾ 1	13/16 1 1/16	1 0	—	0 10 0	60,000	W.Austral	28 & 29 S Swithin's la
Mills' Day Dawn*G*	1⅜ 1⅜ xd	1 5/16 1 7/16	1 0	-/6 May '95	0 15 6	300,000	Queensland	3, Gracechurch-st.
Mosman ....*G*	7/- 8/-	6/- 7/-	1 0	—	1 0 0	59,235	N.S Wales	16, St. Helen's-place.
Mt. Leyshon ....*G*	—	—	1 0	-/6Dec. '90	1 0 0	157,989	Queensland	7, Draper's-gardens.
Mount Morgan *G*	2⅝ 2⅝	2⅝ 2⅝ xd	1 0	-/6 May, 95	0 17 6	1,000,000	Queensland	50, Lime-street.
Mount Zeehan *SL*	-/6 1/-	-/6 1/	1 0	—	1 0 0	193,257	Tasmania	Mansion Ho. Cham.
N. Australian G. F.	19/- 20/-	16/ 20/	1 0	—	1 0 0	20,000		7, Union Court.
New Queen ....*G*	7/6 8/	7/6 8/-	1 0	-/6 Mar.,'95	0 19 6	168,915	Queensland	30, St. Swithin's-la.
Nicol Mines	1 1¼	1 1¼	1 0	—	1 0 0	15,000	Pilbarra ...	151, Cannon St., E.C.
North Coolgardie..	3/3 3/9	3/6 4/-	0 5	—	0 4 0	85,000	Coolgardie	228, Winchester Ho.
N. Q'ld. M. Agency	1 11/16 1 13/16	1⅝ 1⅞	1 0	2/6 Jan. '95	1 0 0	90,000	Queensland	10 New Broad Street
Queen's Bthdy Un.	13/ 14/	11/- 12/-	1 0	—	0 12 6	75,000	Victoria...	7-8, Gt. Wnchster St.
Sam's With.of Nat.	3/- 4/-	3/9 4/3	1 0	—	0 18 0	200,000	W.Austral	33, Old Broad Street.
ScottishAustralian	⅝ ¾	⅝ ⅞ xd	1 0	-/3 May, '95	1 0 0	200,000	N.S Wales	Winchester Ho. E.C.
Victoria Associatn.	—	—	1 0	-/6 June, '95	1 0 0	144,000	Chr. Tow.	6, Crosby-square
Victory.... *G*	7/6 8/6	6/6 7/6	0 5	-/3 Mar.,'94	0 5 0	200,000	Queensland	32, Gresham-st, E.C.
Waihi.... *G*	6⅞ 7⅛	6¾ 7	1 0	3/- June '95	1 0 0	150,000	N.Zealand	11, Abchurch-ln E.C.
Waratah.... *G*	9/6 10/6	9/6 10/6	0 10	—	0 10 0	6,000	Crydn,NZ	43, Threadneedle st.
Wentworth Exten	5/- 6/-	5/- 6/-	0 5	—	0 5 0	178,828	N.S Wales	19, S. Swithin's Lane
Wentworth Ord.*G*	⅝ ⅞	⅝ ⅞	1 0	—	1 0 0	350,000	N.S Wales	4-6, Throgmort. Av.
Went. Priority...*G*	—	—	1 0	5/- May '95	1 0 0	150,000	N.S Wales	4-6, Throgmort. Av.
W. Argentine ....*G*	1/- 1/6	1/- 1/6	1 0	—	0 19 6	150,000	N.Zealand	3-5, Queen-street.
W. Aust. G Conces	1⅜ 1⅞	1⅜ 1⅞	1 0	20% May '95	1 0 0	17,500	W.Austral	33, Old Broad st., EC
W. Aus. Exploring	1⅜ 1⅝	1 7/16 1 9/16	1 0	—	0 15 0	200,000	W.Austral	54, Old Broad st., EC
W.Australian G.F.	3⅜ 3⅝	3 9/16 3 11/16	1 0	2/6 Dec., 94	1 0 0	65,000	Coolgardie	28-29, S. Swithin's-ln.
W. Aust. Mining	4/6 5/6	4/6 5/6	1 0	—	1 0 0	104,297	W.Austral	157, Winchester Ho.
W. Mallina ....*G*	2/6 3/6	2/9 3/3	0 5	—	0 3 0	80,000	Pilbarra ...	Winchester House.
White Feather ...	1⅞ 2	2 13/16 3 1/16	1 0	—	1 0 0	60,000	Coolgardie	28 & 29, S. Swithin's ln
Zapopan ....*G*	7/3 7/6	6/- 8/-	1 0	—	1 0 0	25,000	NW Austra	70, Bishopsgate-street
Zeehan Montana *S*	—	—	1 0	-/4 May 95	1 0 0	68,000	Tasmania	11, Queen Victoria st
Zeehan Montana *S*	—	—	1 0	3½ May 95	0 3 6	12,000	Tasmania	11, Queen Victoria st

EUROPEAN MINES.

Name.	Closing Price, May 24, 1895	Closing Price, May 17, 1895.	Am't. of Share	Latest Dividend.	Called up per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office
			£ s.		£ s. d.			
Alamillos ....*L*	10/- 15/-	10/-15/	2 0	-/6 April '95	2 0 0	35,000	Spain	6, Queen-street-place
Avala ....*Q*	0 ⅛	0 ⅛	1 0	1/- May '93	1 0 0	51,584	Servia.....	4, Tokenho. Bldgs.
Consett Ore	5⅛	5⅛	1 0	5/- July 94	1 0 0	55,200	Spain	19, Grey-st., N'castle
English Cr. Spelter	⅜ ⅝	⅜ ⅝	1 0	2½% Aug. '94	1 0 0	84,000	Lombardy	9, Queen-street-place
Fortuna ....*L*	17/6 22/6	17/6 22/6	2 0	1/- April '95	2 0 0	25,000	Spain	6, Queen-street-place
Libiola....*C*	3⅜ 3⅝	3⅛ 3¼	5 0	4/6 Apr. 95	5 0 0	60,400	Italy	Dashwood Ho., E.C.
Linares ....*L*	4¼ 4¾	4 4⅛	3 0	4/6 April '95	3 0 0	14,998	Spain	6, Queen-street-place
Mason & Barry...*C*	2⅝ 2⅞	2⅝ 2⅞	5 0	2/- May. '94	5 0 0	185,172	Portugal	87, Cannon-street.
Oscar ....*G*	—	—	5 0	—	0 4 6	117,240	Norway ...	6A, Austin Friars.
Pestarena ....*G*	6/6 7/6	6/6 7/6	3 0	—	3 0 0	67,809	Italy	6-7, Queen-street-pl.
Pontgibaud ....*SL*	—	—	20 0	11/6 Dec. '84	20 0 0	14,000	Coueron...	6-7, Queen-street-pl.
Rio Tinto ....*C*	16⅛ 16⅜	15¼ 15⅛	10 0	4/- May,'95	10 0 0	325,000	Spain	30, St. Swithin's-lane
Do. (Mort. Bonds)	103 105	105 107	100 0	5% Apr,'95	100 0 0	£1892,740	Spain	30, St. Swithin's-lane
Do. (2nd do.)	101 103	103 105	100 0	5% Apr. '95	100 0 0	£1024,360	Spain	30, St. Swithin's-lane
Do. (3rd do.)	101 103	101 103	100 0	5 p.c. Apr. 95	100 0 0	£537,080	Spain	30, St. Swithin's lane
Ripanji ....*SQ*	13/- 14/-	13/- 14/	1 0	—	0 19 0	95,000	Servia.....	120, Bishopsgt-st. W[illegible]
Tharsis....*C Sul*	4⅞ 5⅛	4⅞ 5⅛	2 0	4/- May,'95	2 0 0	625,000	Spain	Glasgow.
West Prus Pre.pref	—	—	10 0	8% Mar. 95	10 0 0	365	Germany	Walbrook Ho., E.C.
West Prussian Pre.	—	—	10 0	8% Mar. '95	10 0 0	5,450	Germany	Walbrook Ho., E.C.
West Prussian Or.	—	—	10 0	8% Mar. '95	10 0 0	14,050	Germany	Walbrook Ho., E.C.
Wohlfahrt ....*L*	—	—	1 0	3% Dec. '94	1 0 0	99,634	Prussia ...	17, Victoria-st., S.W.
Wohlfahrt	—	—	1 0	3% Dec. '94	0 10 0	9,090	Prussia ...	17, Victoria-st., S.W.

INDIAN AND ASIATIC MINES.

Name.	Closing Price, May 24, 1895	Closing Price, May 17, 1895.	Am't. of Share	Latest Dividend.	Called up per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office
Asia Minor Pref. *Sl.*	—	—	0 10	—	0 10 0	42,430	Asia Minr	2, Metal Ex. Bldgs.
Do. Ord. ...	—	—	0 10	—	0 10 0	59,838	Asia Minr	2, Metal Ex. Bldgs.
Balaghat Mysore*G*	4/- 4/6	4/- 4/6	1 0	—	0 19 0	159,945	India	6-7, Queen-street-pl.
Burma Ruby....*R*	15/16 1 1/16	19/6 20/6	1 0	—	0 18 0	298,551	Burmah...	Suffolk House, E.C.
ChampionReef...*G*	4⅝ 4⅞	4⅝ 4⅞	1 0	4/- Apr. '95	1 0 0	200,000	India	6-7, Queen-street-pl.
Colar Central ...*G*	2/- 2/6	2/- 2/6	1 0	—	1 0 0	200,000	India	Dashwood Ho., E.C.
Coromandel.... *G*	⅛ ⅜	9/16 11/16	1 0	—	0 15 0	95,000	India	6-7, Queen-st.-place.
GoldFldsMysore*G*	26/6 27/6	26/6 27/6	1 0	1/- July '93	1 0 0	275,000	India	6-7, Queen-street pl.
Gold Flds Siam *G*	—	—	1 0	—	1 0 0	150,000	Siam	19, St. Swithin's-lane.
Hyderabad Dec. ..	9 9¼	8⅝ 8⅞	10 0	—	10 0 0	115,000	Deccan ..	16, St. Helen's-place.
Kempinkote GdFd	2/6 3/	2/9 3/3	0 5	—	0 3 6	750,000	India	6-7, Queen-st.-place.
Mysore ....*G*	2⅝ 3	2⅞ 3	1 0	2/- Feb, '95	1 0 0	248,354	India	6-7, Queen-street pl.
My. Harnhalli ...*G*	4/- 4/6	4/ 4/6	1 0	—	0 18 0	100,007	India	2, East India Avenue
Mysore Reefs ...*G*	7/6 8/6	7/ 8/	1 0	—	1 0 0	160,000	India	6-7, Queen-street-pl.
Mysore West(N)*G*	19/- 20/-	15/16 1	1 0	—	0 19 0	127,408	India	Dashwood Ho., E.C.
Mysore Wynaad *G*	19/- 20/-	15/16 1	1 0	—	0 19 0	125,000	India	Dashwood Ho., E.C.
Nine Reefs ....*G*	3/6 4/6	3/6 4/6	0 10	—	0 10 0	250,000	India	6-7, Queen-street-pl.
Nundydroog....*G*	1⅞ 2	1⅞ 2	1 0	1/6 Mar. '95	1 0 0	200,000	India	6-7, Queen-street-pl.
Ooregum (Dl.O.)*G*	3⅛ 3⅜	3⅛ 3⅜	1 0	2/6 Apr. '95	1 0 0	145,000	India	6-7, Queen-street-pl.
Do. (10% Pref.).	3⅞ 4⅛	3⅞ 4⅛	1 0	2/6 Apr. 95	1 0 0	107,011	India	6-7, Queen-street-pl.
Do. (10% Pref.).	3⅜ 3⅝	3⅜ 3⅝	1 0	2/6 Apr. '95	0 5 0	12,989	India	6-7, Queen-street-pl.
Pahang Kabang *T*	⅜ ½	⅜ ½	1 0	—	1 0 0	200,000	Malay Pn.	4a, Jeffrey's sq., E.C
S. Aust. Petroleum	1/- 2/-	1/6 2/	1 0	—	0 18 6	108,000	Burmah...	12, Pancras Ln., E.C.
Straits Developmt.	2⅛ 2⅜	2⅛ 2⅜	1 0	—	0 19 0	184,292	Pahang ...	15, Copthall Avenue.
Yerrakonda ....*G*	2/6 3/-	3/- 3/6	0 4	—	0 2 6	187,491	Mysore ...	6-7, Queen-street-pl.

NORTH AMERICAN MINES.

Name.	Closing Price, May 24, 1895	Closing Price, May 17, 1895.	Am't. of Share	Latest Dividend.	Called up per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office
Alaska Mexican...*G*	1⅛ 1⅜	1⅛ 1⅜	$5	7 1-5d. Apr. 95	$5	180,000	Alaska......	30, St. Swithin's-ln
Alaska Treadwell*G*	3⅛ 3⅜	3⅛ 3⅜	$25	1/6 Jan.,'95	$25	200,000	Alaska.....	30, St. Swithin's-ln.
Almada and T....*S*	-/7½ -/10½	-/7½ /10½	2/6	—	0 2 6	351,008	Mexico ...	6, Queen-street-place
American Belle...*S*	2/3 2/9	2/3 2/9	1 0	-/6 Mar. '91	1 0 0	398,890	Colorado	25A, Old Broad-street
Anglo Mexican ...*S*	—	—	5 0	3/- Jan. '90	5 0 0	74,850	Mexico ...	23, College Hill.
Arizona (Pref.) *Cu*	—	25/- 25/3	4 0	—	4 0 0	158,920	Arizona ...	74, Geo.-st., Edinbor
Do. 6½ A Deben.	—	95 xd	100 0	6½% May '95	100 0 0	£135,300	Arizona ...	74, Geo.-st., Edinbor
Do. 7% B Deben.	—	82 xd	100 0	7% May '95	100 0 0	£181,300	Arizona ...	74, Geo. st. Edinbor
Big Creek ..... *Ay.*	2/6 3/6	2/6 3/6	1 0	1/- Dec. '91	1 0 0	50,000	Nevada ...	11, Queen Victoria-st.
California ....*G*	—	—	0 10	-/6 May 90	0 10 0	621,808	Colorado	St. George's Ho. E.C.
Colorado Boy....*S*	—	—	1 0	—	1 0 0	112,492	Colorado	11, Poultry, E.C.
Cortes ....*S*	—	—	1 0	3% Feb.'93	1 0 0	300,000	Nevada ...	Suffolk House, E.C.
Decatur.....*Sl.*	—	—	1 0	—	1 0 0	32,500	Colorado	35, Queen Victoria-st.
Do.... (Pref.)	—	—	1 0	—	1 0 0	12,500	Colorado	35, Queen Victoria-st
De Lamar....*GS*	1⅛ 1¼	1 5/16 1 7/16	1 0	1/- Apr,'95	1 0 0	400,000	Idaho......	6, Draper's-gardens.
Dickens Custer*GS*	2/3 2/9	2/- 2/6	1 0	—	0 19 9	420,000	Idaho......	Winchester Ho. E.C
Elkhorn ....*S*	8/6 9/6	9/6 10/6	1 0	-/6 May '95	1 0 0	175,007	Montana	6, Draper's-gardens.
Emma ....*S*	1/- 1/6	1/3 1/9	0 5	—	0 5 0	403,618	Utah	15, Geo-st, Mansn. Ho
Flagstaff ....*S*	—	—	1 0	—	0 19 9	840,000	Utah	Dashwood Ho., E.C.
Fisk.... *G*	—	—	1 0	6d May, 94	1 0 0	134,000	Colorado	5, Fenchurch st.
Garfield ....*GS*	—	—	1 0	-/6 Dec. '88	0 19 6	98,185	Nevada ...	Suffolk House, E.C.
Gen. M'g. Assoc. ...	6 6⅛	6 6⅛	5 10	14/- Apr. 95	5 10 0	27,469	C. Breton	Blomfield House.
Golden Feather *G*	11/16 13/16	14/ 16/	1 0	—	1 0 0	180,000	California	St. Stephens Cs E.C.
Golden Gate ....*G*	4/ 5/	4/ 5/	1 0	—	0 19 6	79,600	California	St. Stephens Cs E.C.
Golden Leaf..... *G*	4/3 4/9	4/3 4/9	1 0	—	1 0 0	300,259	Montana	8, Draper's Gardens.
Golden Valley...*G*	1/3	1/3	1 0	—	0 19 0	55,507	Colorado	15, Angel Court.
Harquahala.... *G*	2/ 3/	2/- 3/-	1 0	-/6 Oct.,'94	1 0 0	300,000	Arizona ...	6, Draper's Gardens.
Holcomb Valley *G*	2/- 2/6	3/3 3/9	0 5	—	0 5 0	540,000	California	14, Cornhill, E.C.
Idaho....*GS*	5/4½ 5/7½	5/- 5/6	0 5	-/2 Dec. 94	0 4 8	143,439	Idaho ...	140, Leadenhall-st.
Jackson Goldfields	1/6 2/-	1/3 1/9	5 0	—	0 5 0	408,635	California	11, Poultry, E.C.
Jay Hawk (New)*G*	1/6 2/6	3/6 4/	1 0	-/6 Dec. '92	0 19 3	285,000	Montana	Dashwood House.
La Plata....*S*	2/6 3/-	2/6 3/-	0 5	1/3 Oct. '82	0 4 6	405,000	Colorado	11, Poultry, E.C.
La Yesca ....*GS*	6/6 7/6	6/ 7/	1 0	—	0 19 0	175,015	Mexico ..	20, Bucklersbury, EC
Maid of Erin ...*S*	4/6 5/6	4/6 5/6	1 0	4c.p.sh Sept'94	1 0 0	575,000	Colorado	43, Threadneedle-st.
Mammoth Gold ...	—	—	1 0	—	1 0 0	400,000	Pnal, Ariz.	257, Winchester Ho.
Mesq. d'l Oro (P) *G*	—	—	5 0	—	5 0 0	10,000	Mexico ...	Dashwood Ho., E.C.
Mesq. d'l Oro (D) *G*	—	—	5 0	—	5 0 0	10,000	Mexico ..	Dashwood Ho., E.C.
Montana .... *GS*	9/16 11/16	12/6 13/6	1 0	-/3 Apr. '95	0 19 0	657,158	Montana	Gresham House, E.C.
New Colorado ...*S*	—	—	1 0	—	0 17 0	65,000	Colorado	Abchurch Cham. E.C
N. Consolidated*SC*	—	—	0 5	—	0 3 6	248,576	Nevada ..	15, Angel-court, E.C
N. Gold Hill....*G*	1/6 2/-	2/6 2/9	1 0	—	0 19 9	191,045	NCarolina	15, George-st., E.C.
New Guston ....*S*	9/16 11/16	½ ⅝	1 0	1/- Oct. '92	1 0 0	110,000	Colorado	25A, Old Broad-st.
New Hoover Hill*G*	-/3 -/6	-/3 /6	0 10	-/9 Dec. '85	0 10 0	120,000	NCarolina	Langthorne Ho., E.C.
Palmarejo .... *GS*	3/- 3/9	3/- 3/6	1 0	—	1 0 0	418,888	Mexico ...	4, Copthall-building
PinosAltos(Df)*GS*	⅜ ⅜	⅜ ⅛	1 0	-/6 Mar.' 90	1 0 0	100,000	Mexico ...	110, Cannon-street.
Do. 15% Cum Pref	¾ 1	¾ 1	1 0	—	1 0 0	60,000	Mexico ...	110, Cannon street.
Pittsbg Con. (N) *G*	—	—	1 0	1/6 Mar. '88	0 19 0	77,147	Nevada ...	Suffolk House, E.C
Pocrman Con. *GS*	2/9 3/3	3/6 4/	0 5	—	0 5 0	273,948	Idaho......	5, Copthall-b'gs. E.C
Red Mountain ...*S*	—	—	1 0	—	1 0 0	46,686	Colorado	11, Poultry, E.C.
Richmond ...*GSL*	1¼ 1⅛	⅝ ⅝	5 0	1/- Nov. '94	5 0 0	54,000	Nevada ...	44, Coleman-street.
Sierr Butter ...*G*	¼ ⅜	⅛ ⅜	2 0	-/6 Apr. '95	2 0 0	122,500	California	138, Leadenhall-st.
Do. Plumas Eur. *G*	⅝ ¾	½ ⅝	2 0	-/9 Apr. '95	2 0 0	140,265	California	138, Leadenhall-st.
Springdale....*G*	2/9 3/3	2/3 2/9	$1	2d Aug., 94	$1	1,000,000	Colorado	20, Abchurch Lane.
Twin Lake Placers	1¼ 1⅜	1¼ 1⅜	1 0	3/- Feb. '95	1 0 0	26,000	Colorado	5, Lawrence P. Hl. E.C
United Mexican *S*	⅛	⅛	1 0	2/6 May,'87	1 0 0	906,654	Mexico ...	3, Gt. Winchester-st.

SOUTH AND CENTRAL AMERICAN MINES.

Name.	Closing Price, May 24, 1895	Closing Price, May 17, 1895.	Am't. of Share	Latest Dividend.	Called up per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office
Anglo-Chilian Pt*N*	9¼ 10	9¼ 9¾	10 0	4/5 Dec. '89	10 0 0	35,000	Antofagst.	123, Bishops.-st. W.
Do. 6% Rylst*MB*	102 105	102 105	100 0	7% May, '95	100 0 0	£200,000	Antofagst.	123, Bishops.st. W.
Antio. (Pref.) *G.S.*	—	—	1 0	-/6 Mar. '90	1 0 0	22,823	Colombia	184, Gresham Ho.
Antioquia(ordiny)	—	—	1 0	—	1 0 0	42,453	Colombia	184, Gresham Ho.
Caratal.... *G*	1/3 1/6	1/4½ 1/7½	2/6	—	0 2 6	1,230,000	Venezuela	57, Moorgate-st. E.C
Caylloma....*S*	1⅛ 1⅜	1⅛ 1⅜	2 0	1/- Apr. 94	2 0 0	125,000	Peru	52, Leadenhall street
Colon ....*G*	1/6 2/-	1/6 2/-	0 5	—	0 4 0	200,000	Colombia	5, Copthall-bdgs., E.C.
Colorado Nit. ....*N*	2 2⅛	2 2⅛ xd	5 0	4/- May, '95	5 0 0	32,000	Chili	12, King-st., Liverp'l
Colombia...... ....*G*	—	—	20 0	10 frs. Aug. 94	20 0 0	—	Venezuela	Ciudad Bolivar.
Colombian Hy...*G*	9/16 11/16	9/16 11/16	1 0	1/- Sept. '94	1 0 0	75,000	Colombia	10, Blomfield-street
Copiapo ....*C*	2 2¼ xd	2 2⅛	2 0	1/6 May '95	2 0 0	100,000	Chili	DashwoodHouse, E.C
Darien "A" ....*G*	2¾ 3	3 3⅛	1 0	—	1 0 0	49,553	Colombia	Manchester.
Don Pedro....*G*	1/16 ⅛	1/16 ⅛	1 0	—	0 18 6	133,102	Brazil......	24-5, Devonsh.Cs E.C
El Callao ....*G*	⅛ ⅜	⅛ ⅜	5 0	9½d Feb, '94	5 0 0	157,000	Venezuela	8, Bishopsgt.-st, Wn
Frontino & B....*G*	1⅛ 1⅜	1¼ 1⅜	1 0	1/- Mar. '95	1 0 0	125,662	Colombia	184, Gresham House
Glenrock ....*G*	1/3 1/9	1/3 1/9	1 0	—	1 0 0	199,948	Arg. (&I.)	3-5, Queen-street, E.C
Gravel.... ....*G*	4/6 5/-	4/6 5/	1 0	—	0 18 6	100,000	Colombia	10, Blomfield-street
Guadalupe ....*GS*	3/6 5/-	3/6 5/	1 0	—	1 0 0	180,000	Honduras	11A, Union-ct. Old Broad

"THE MINING JOURNAL" SHARE LIST—(Continued)

SOUTH AND CENTRAL AMERICAN MINES—(Continued).

Name.	Closing Price, May 24, 1895	Closing Price May 17, 1895.	Am't. of Share	Latest Dividend.	Called up Per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office.
			£ s.		£ s. d.			
Huanchaca ... S	—	—	5 0	4/- Sept. '94	5 0 0	320,000	Bolivia ...	10, Avnu. d'Alma, Paris
Javali ... G	-/6 1/6	-/6 1/6	0 2	8½ % '91	0 2 0	105,234	Nicaragua	139, Cannon-street.
Julia Taltal ... N	7/16 9/16	7/16 9/16	1 0	—	1 0 0	200,000	Chili ...	79½, Gracechurch-st.
Lagunas ... N	5¼ 6	5¼ 6	5 0	15p.c. Dec.'94	5 0 0	120,000	Tarapaca	3, Gracechurch st.
Lautaro ... N	7¾ 8¼	7¾ 8¼	5 0	7/6 Dec. 94	5 0 0	110,000	Chili ...	70, Gracechurch st.
Liverpool ... N	10½ 11½	10½ 11½xd	5	15/-May, 95	5 0 0	22,000	Chili ...	Liverpool.
Loma ... G	2/- 2/6	2/ 2/6	1 0	—	1 0 0	300,000	Colombia	5, Copthall-building.
London Nit. ... N	1½ 2	1½ 2	3 0	3/4¾ Nov. '89	5 0 0	10,000	Chili ...	9, Gracechurch-st
London Nit. (Pref.)	3½ 4	3½ 4	5 0	8% Nov. '94	5 0 0	22,000	Chili ...	9, Gracechurch-st
Macate ...	2/6 3/	2/6 3/	0 2	—	0 2 0	200,000	Peru ...	11, Old Broad-st, E.C
New Tamarugal N	7/16 9/16	7/16 9/16	1 10	1s. Dec. '94	1 10 0	130,000	Tarapaca	50, Lime-street, E.C
Do. 8 % Cum Pref	15/16 1 1/16	15/16 1 1/16	1 10	8 p.c. Feb. '95	1 10 0	130,000	Tarapaca	50, Lime-street, E.C
Do 6 p.c. Debs ...	88 92	91 95	100 0	6 p.c. Feb. '95	100 0 0	£260,000	Tarapaca	50, Lime-street, E.C
Oilta ... G	1/6 2/-	1/6 2/	1 0	1/- April '89	1 0 0	30,000	Colombia	10, Blomfield-street.
Ouro Preto ... G	—	—	1 0	—	1 0 0	80,000	Brazil ...	6, Queen-street-place
Pac. & Jazpampa N	3 3½xd	3 3½	5 0	4/- May, '95	5 0 0	72,000	Tarapaca	3, Gracechurch-st.
Primitiva ... N	1¼ 1¾	1¼ 1¾	5 0	2½% Oct. '89	5 0 0	40,000	Chili ...	Liverpool.
Quebrada ... C	3/16 5/16	¼ ⅜	3 0	5% Mar. '92	3 0 0	241,956	Venezuela	38, Nicholas Lane.
Quebrada ... C	—	—	Stk.	6% Feb., 94	100 0 0	£400,000	Venezuela	38, Nicholas Lane.
Rosario ... N	5 5½	4¾ 5½	5 0	12/6 May '95	5 0 0	120,000	Chili ...	57¼, OldBroad-street
Rosario (5% Deb.)	103 105	103 105	100 0	5% April '95	100 0 0	£475,000	Chili ...	57¼, OldBroad-street
St. John del Rey G	1⅛ 1⅝	1¼ 1⅝	1 0	10% June '82	1 0 0	323,090	Brazil ...	Finsby.Ho., Blmf'd st
San Donato ... N	2 2½xd	2¼ 2¾	5 0	2/6 May, '95	5 0 0	32,000	Chili ...	12, King-st., Liverp
San Jorge ... N	5 5½	6 6½	5 0	12/6 May '95	5 0 0	75,000	Chili ...	9, Gracechurch-st.
San Pablo ... N	1¾ 2¼	1¾ 2¼	5 0	2½% Nov., '94	5 0 0	32,000	Chili ...	Gracechurch-st
Santa Barbara ... G	—	—	0 10	1/3 Dec. '86	0 10 0	80,000	Brazil ...	Liverpool
Santa Elena ... N	⅜ ⅝	⅜ ⅝	5 0	5/- Oct. '94	5 0 0	22,000	Tarapaca	3, Gracechurch-st.
Santa Rita ... N	3 3¼xd	3½ 4	5 0	15/- May, '95	5 0 0	20,000	Chili ...	DashwoodHouse, E.C
San Sebastian ... N	2 2½xd	2¼ 2½	5 0	5/ May, '95	5 0 0	29,000	Chili ...	DashwoodHouse, E.C
Segovia ... G	—	—	5/-	—	0 5 0	120,000	Colombia	5, Copthall-buildings
Sucre Pref. ... G	—	—	1 0	10% Dec. '94	0 15 0	840	Colombia	23, St. Swithin's ln.
Sucre Ord. ... G	—	—	1 0	6% Dec. '94	1 0 0	10,000	Colombia	23, St. Swithin's ln.
Tolima "A" ... S	7¼ 7¾	8 9	5 0	10/- Apr., '95	5 0 0	14,000	Colombia	18, Finsbury-circus.
Do. "B" ... S	6½ 7	6½ 7	5 0	10/- Dec., '94	5 0 0	6,000	Colombia	18, Finsbury-circus.
Vic. & Altamira ...	2/9 3/3	2/3 2/9	0 5	—	0 5 0	200,000	Venezuela	Broad-st. Avenue.
West Indian ... G	—	—	0 1	—	0 1 0	1,725,585	Singo.Dm	110, Cannon-street.

AFRICAN MINES.

Name.	Closing Price, May 24, 1895	Closing Price May 17, 1895.	Am't. of Share	Latest Dividend.	Called up Per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office.
Abercorn Reef ... G	-/9 1/	/9 1/	0 5	—	0 4 0	—	Millwood	16, Tokenhouse Yard
African Alluvial ...	1 9/16 1 11/16	31/ 32/6	1 0	—	1 0 0	130,000	Mozambiq	11, Poultry.
African Alluvial ...	12/9 13/3	13/ 13/6	1 0	—	0 3 6	20,000	Mozambiq	11, Poultry.
African Coal ...	9/3 9/9	9/6 10/	1 0	—	0 16 8	300,000	Middlebrg	19, St. Swithin's-lane
African Gold Con.	2/3 2/9	2/6 3/-	0 10	20 p.c. Jan.'95	0 8 0	300,000	Mossel By	16, Tokenhouse-yard
African Gold Ryco.	1⅜ 1⅝	1 7/16 1 9/16	1 0	2/- Oct. 94	1 0 0	175,000	—	23, College Hill.
Afrikander ... G	2⅜ 2⅝	2⅜ 2⅝	1 0	—	1 0 0	40,000	Transvaal.	19, St. Swithin's-lane
Agnes Block ... G	9/16 11/16	9/16 11/16	1 0	—	1 0 0	78,507	Transvaal.	54, Old Broad-street
Alexandra Estate G	12/ 13/	12/ 13/	1 0	—	1 0 0	225,000	Rand ...	Warnford Court, EC.
Anglo-French Exp.	3¼ 3⅜	3¼ 3¾ xd	5 0	10% Dec. 94	5 0 0	30,300	S. Africa	170, Winchester Ho.
Appantoo ... G	—	—	1 0	—	1 0 0	77,885	West Cost	Dashwood House.
Aurora ... G	1⅛ 1¼	1⅛ 1¼	1 0	5% Mar, '93	1 0 0	65,000	Rand ...	8, Old Jewry.‡
Balkis Eersteling G	4/- 4/6	3/6 4/	0 10	—	0 10 0	520,000	Transvaal.	85, Gracechurch-st.
Balkis Land ...	5/ 5/3	4/9 5/3	0 10	—	0 10 0	520,000	Transvaal.	85, Gracechurch-st.
Banket ... G	8/ 9/	8/ 9/	1 0	—	1 0 0	200,000	Rand ...	Johannesburg.
Bantjes Reef ... G	3 3⅛	2½ 2¾	1 0	—	1 0 0	83,000	Rand ...	Warnford-court.†‡
Barrett ... G	12/6 13/6	11/6 12/6	0 10	—	0 9 0	207,496	De Kaap	17, Basinghall-street
Bechuanaland Exp.	2 1/16 2⅛	2 5/16 2 7/16	1 0	1/- Mar. 95	1 0 0	200,000	Bechuana.	19, St. Swithin's-lane.
Bech. Trad'g Assoc.	1 7/16 1 9/16	1 11/16 1 13/16xd	1 0	10 p c May, 95	1 0 0	100,000	Bechuana.	19, St. Swithin's-lane.
Big Golden Quarry	2/6 3/	2/6 3/-	5/-	—	0 5 0	483,226	Kaap Rivr	4, Bishpsgte. st. Wn.
Block "B" Lang.	25/6 26/6	25/6 26/6	1 0	—	1 0 0	535,000	Rand ...	5, Princes-st., E.C.‡
Booysen Land ... G	2¼ 3¼	3⅜ 3⅝	1 0	—	0 12 0	95,000	Transvaal.	4, Tokenhouse-blds
Brit. S. A. Char. ...	3 13/16 3 15/16	3 11/16 3 13/16	1 0	—	1 0 0	2,000,000	S. Africa	19, St. Swithin's-lane
Buffelsdoorn ... G	5 1/16 5 9/16	4⅞ 5⅜	1 0	—	1 0 0	250,000	Potchefstr	7, Lothbury.
Buluwayo Synd. ...	⅞ 1pm	⅞ 1pm	1 0	—	1 0 0	12,000	Matabele.	10, Helen's Place.
Cape Asbestos ...	2¼ 2⅛	2¼ 2⅝	1 0	—	1 0 0	50,311	Orange Rv	19, St. Swithin's-lane
Cape Copper ... C	2 2⅜	1⅞ 2⅛	2 0	1/3 Dec. '94	2 0 0	300,000	Cape Col.	9, Queen-street-place.
Do. 6 % Pref. ...	2 2⅛	2 2⅜	2 0	1/3 Dec. '94	2 0 0	45,000	Cape Col.	9 Queen-street-place
Cassel Colliery ...	4⅜ 4⅝	4⅞ 5⅛	1 0	10pc June'95	1 0 0	75,000	Johanbrg.	99, Cannon-street.
Cen. Montrose ... G	6/- 7/-	6/- 7/	1 0	—	0 18 6	69,000	Transvaal.	15, George st. Mn. Ho.
Champ d'Or ... G	4 4¼	4 4¼	1 0	4/- Jan. 95	1 0 0	116,016	Rand ...	8, Old Jewry, E.C.
Champ d'Or Deep G	1 13/16 1 15/16	1¾ 1⅞	1 0	—	1 0 0	117,499	Rand ...	8, Old Jewry, E.C.
City and Suburb. G	24⅛ 25	24 24½	1 0	25% Mar. '95	1 0 0	75,000	Rand ...	96, Gresham Ho., E.C
Coetzeestroom ... G	7/3 7/9	7/3 7/9	0 5	—	0 5 0	140,000	De Kaap	105, Leadenhall-street
Con. Bultfontein D	28/6 29/	28/9 29/3	1 0	3¾% Sept. '94	1 0 0	721,500	Griqualnd	62, Lombard-st.
Con. Deep Levels G	5 5¼	4⅞ 5	1 0	4/- June '94.	1 0 0	187,250	Transvaal	30, St. Swithin's-lane
Con. G. Fields S A.	9⅛ 9⅜	8⅞ 9 xd	1 0	5/- May '95	1 0 0	1,250,000	S. Africa	8, Old Jewry.
Do. 6 % Pref. ...	1 1/16 1 3/16	1 1/16 1 3/16	5 0	—	1 0 0	1,243,999	S. Africa	8, Old Jewry.
Do. 5½ % Deben...	110½ 111¼	110 111	1 0	5½ Jan, '95	5 0 0	670,000	S. Africa	8, Old Jewry.
Crown Reef ... G	9⅞ 10⅛	9⅞ 10⅛	1 0	25% June'95	1 0 0	120,000	Rand ...	120, Bishopsgt st Wn‡
De Beers Consol. D	21 21¼	20¼ 20¾	5 0	12/6 Jan. '95	5 0 0	789,791	Transvaal.	62, Lombard-street.
Do. 5% 1st Deb. ...	109 110	108 108½	—	5% Jan. '95	—	£3,500000	Transvaal.	62, Lombard-street.
Do. 5½ % Bul. Ob.	104 105	103 104	—	5½% Apr. 95	—	720,000	Transvaal.	62, Lombard-street.
Durban Roodept. G	7 5/16 7 9/16	7 7⅛	1 0	3/- Mar., '95	1 0 0	£125,000	Rand ...	28, Leadenhall-bldgs
Eastleigh ... G	1 11/16 1 13/16	1¾ 1⅞	1 0	—	1 0 0	240,000	Klerksdrp	Winchester House.
East Rand ... G	4⅜ 4⅞	4 13/16 4 15/16	1 0	—	1 0 0	570,000	Rand ...	170, Winchester-ho.
Evelyn ... G	1⅛ 1⅜	1⅛ 1¼	1 0	10% Jan. '89	1 0 0	68,000	Rand ...	28, Old Jewry, E.C.
Exploration ...	1¾ 2 p.m.	1¾ 2 pm.	1 0	1/- Dec. 94	0 4 0	148,000	S. Africa	30, S. Swithin's-ln.‡
Exploring Co. ...	6⅜ 6⅞	6 6½	1 0	25/- Feb. '94	1 0 0	69,350	S. Africa	19, S. Swithin's-ln.
Ferreira ... G	16½ 17½	16½ 17½	1 0	50% Mar. '95	1 0 0	45,000	Rand ...	120, Bishopsgt st. Wn‡
Forbes Reef (Nw) G	—	—	1 0	—	1 0 0	105,000	De Kaap	45-6, Leadenhall-st.
F Johnson & Co. ...	19/- 20/-	19/6 20/6	1 0	—	1 0 0	200,000	Mashonld.	8, Old Jewry‡
Geldenhuis Deep G	8¼ 8¾	8⅝ 9	1 0	—	1 0 0	265,000	Transvaal.	30, St. Swithin's-lane.
Geldenhuis Est. G	6⅜ 6⅜	6⅜ 6¾	1 0	5% April '95	1 0 0	187,500	Rand ...	120, Bishopsgt st. Wn‡
Do. Main Reef	1 1/16 1 1/16	24/6 25/6	1 0	5% Apr., 95	1 0 0	150,000	Rand ...	Warnford Court, E.C
George and May G	1 3/16 1 5/16	1 9/16 1 11/16	1 0	—	1 0 0	112,750	Rand ...	7, Great St. Helen's.
George Goch ... G	2⅞ 3	2 15/16 3 1/16	1 0	—	1 0 0	100,000	Rand ...	Johannesburg.
Ginsberg ...	1 13/16 1 15/16	1 11/16 1 13/16	1 0	—	1 0 0	130,000	Drietfon.	Warnford Court, E.C‡
Glencairn ... G	3¾ 3⅞	3¾ 4	1 0	7½ pc Jan. 95	1 0 0	200,000	Rand ...	2, Drapers-gardens.
Gold Coast Devel.	7/9 8/3	7/9 8/3	—	—	—	—	—	11, Queen Victoria-st
Gold Estates T. ... G	12/- 13/-	12/- 13/-	1 0	15% Dec.'89	0 10 0	130,000	Transvaal.	46, Queen Victoria-st
Gld. Fls. Deep ... G	6⅝ 6⅞	5⅞ 6⅛	1 0	—	1 0 0	600,000	S. Africa	8, Old Jewry.
G. F. of Mashonld.	⅝ ¾	⅝ ¾	1 0	—	1 0 0	200,000	Mashonld	19, St. Swithin's-ln.
G. F. Tierra d' Fuego	3/9 4/3	3/9 4/3	0 4	—	0 4 0	400,000	Mozambiq	2, Tokenhouse Bldgs
Grahamstown ... G	18/- 19/-	17/- 18/-	1 0	—	1 0 0	150,000	Rand ...	14, Throgmorton-st.

AFRICAN MINES—(Continued)

Name.	Closing Price, May 24, 1895	Closing Price, May 17, 1895.	Am't. of Share	Latest Dividend.	Called up Per Share.	Amount of Stock or No. of Shares Issued.	Situation of Mine.	Head Office.
			£ s.		£ s. d.			
Graskop ... G	7/9 8/3	8/3 8/9	0 5	2½% Mar. '92.	0 5 0	400,000	Lydenburg	85, Gracechurch-st.
Griqualand W. ... D	7⅜ 7⅝	7⅜ 7⅝	10 0	2 % Sept. '94		105,700	Transvaal.	82, Lombard-street
Guy Fawkes ... G	10/- 11/6	12/- 13/-		—	10 0 0		—	
Gwelo Exploratn.	4/9 5/3	5/3 5/9	0 10	—	0 8 0	24,000	Manica ...	Broad-st. Avenue
Harmony (Pref) G	8/6 9/6	8/6 9/6	1 0	—	1 0 0	260,000	—	79½, Gracechurch-st
Henderson's Trans	3¼ 4	3⅛ 3¼	1 0	—	1 0 0	250,000	Zoutpanbg	85, Gracechurch st.
Henry Nourse ... G	5¾ 6	5¾ 6	1 0	—	1 0 0	100,000	De Kaap ...	Warnford-court.
Joe's Reef ... G	⅞ 1	⅞ 1	1 0	—	1 0 0	57,404	De Kaap ...	21, Mincing Lane.
Johannesburg G.F	6/ 7/	⅜ ½	1 0	—	1 0 0	99,537	Johanburg	31, Lombard st., E.C
Johannes. Invest.	4¼ 4⅜	4 4½	1 0	10 p c Dec. 94	1 0 0	650,000	—	7, Lothbury.
Johannesburg Pnr	5 5½	5 5½	1 0	12½ % Nov., '93	1 0 0	21,000	Rand ...	Johannesburg.
Jubilee ... G	10¼ 10¾	10½ 11	1 0	30% April '95	1 0 0	30,000	Rand ...	8, Old Jewry.†
Jumpers ... G	4⅞ 5⅛	4⅞ 5⅛	1 0	25% Dec. '94	1 0 0	100,000	Rand ...	120, Bishopsgt st. Wn‡
Kaffirs ...	¾ 1	¾ 1	1 0	—	1 0 0	80,000	Nrth. Kaap	3, Budge Row, EC
Kimberley ... D	par ⅛ pm	par ⅛ pm	1 0	—	0 10 0	98,672	Kimberley	19, Finsbury circus.
Kimberley Rdpt. ...	3¾ 3⅞	4⅛ 4¼	1 0	—	1 0 0	125,000	Kimberley	2, Drapers-gardens.
Klerksdorp ...	22/6 23/6	23/6 24/6	0 10	—	0 8 0	400,000	—	110, Cannon St.
Koffyfontein ... D	1¼ 1⅜	1 5/16 1 7/16	1 0	—	1 0 0	125,000	Jacobsdaal	120, Bishopsgt st. Wn
Langlaagte Est. G	5 1/16 5 1/16	4 3/16 4 15/16	1 0	10 p.c. Mar.'95	1 0 0	470,000	Rand ...	59, Holborn Viaduct
Do. Royal	3 15/16 4 1/16	4 1/16 4 5/16	1 0	5% Sept. '93	1 0 0	100,000	Rand ...	2, Drapers-gardens.
Lionsdale ...	9/- 10/-	9/- 10/-	1 0	—	1 0 0	115,000	Lydenburg	85, Gracechurch-st.
Lisbon-Berlyn ... G	6/- 6/6	5/6 6/-	2/6	—	0 2 6	889,233	Lydenburg	110, Cannon-street
London & S. A. Ex.	11¾ 12¼	11¾ 12¼	0 10	3/- Mar. '95	0 10 0	100,000	S. Africa ...	19, Finsbury-circus.
Lower Roodepoort	7/3 7/9	6/- 7/-	1 0	—	1 0 0	150,000	Vlakfontn	8, Old Jewry, E.C.
Luipaards Vlei Est.	19/- 20/-	18/6 19/6	1 0	6% Mar. '90	1 0 0	319,003	Rand ...	Warnford-court.‡
Main Reef (New) G	1 7/16 1 9/16	1 7/16 1 9/16	1 0	—	0 10 0	300,000	Rand ...	8, Old Jewry.
Mashon. Agency ...	2⅞ 3	2 9/16 2 11/16	1 0	—	1 0 0	100,000	Mashonald	8, Old Jewry, E.C.
Massi Kessi ...	9/6 10/6	9/6 10/6	0 10	—	1 0 0	60,000	Manica ...	Broad Street Avenue
May Con. (New) G	3 1/16 3 3/16	3⅛ 3¼	1 0	10 p c Apr. 95	1 0 0	430,000	Rand ...	4, Lothbury.‡
Metropolitan (N) G	2 11/16 2 13/16	2¼ 2⅜	1 0	—	1 0 0	75,020	Rand ...	1, Crosby Square ‡
Meyer & Charl. ... G	7¼ 7⅛	7⅜ 7⅝	1 0	30% Dec., '94	1 0 0	71,687	Rand ...	Warnford-court.‡
Modderfontein ... G	14⅝ 14⅞xd.	14⅛ 14¾	1 0	—	1 0 0	200,000	Rand ...	Warnford-court.‡
Montrose ... G	¾ 1	13/16 15/16	1 0	3/- Feb. '90	1 0 0	70,000	De Kaap ...	65, New Broad-street
Moodies G.&E. ... G	15/16 1 1/16	⅞ 1	1 0	-/4 May '90	1 0 0	240,000	De Kaap	8, Old Jewry.‡
Mozambique ...	30/- 31/-	29/- 30/-	1 0	—	1 0 0	400,000	S E. Africa	Broad-street House.
Namaqua ... C	1⅜ 1⅝	⅞ 1⅛	2 0	2/6 July '91	2 0 0	94,351	Namaquald	34, Leadenhall-blds.
New African ...	5⅛ 5¼	5½ 5¾	1 0	—	1 0 0	190,000	—	83, Hatton Garden.
New Ariston ...	—	—	1 0	—	1 0 0	21,180	Klerksdorp	Winchester House.
New Aurora West G	—	—	1 0	5% Mar., '93	1 0 0	30,000	Rand ...	1, Crosby Square
N. Belgium Land ...	7/16 9/16	7/16 9/16	1 0	—	0 17 0	167,462	Waterberg.	33, Cornhill.
New Chimes ... G	2⅞ 3	2 15/16 3 1/16xrt	1 0	2/- Feb., '95	1 0 0	100,000	Rand ...	8, Old Jewry, E.C
New Clewer Estate	1⅛ 1⅝	1⅛ 1⅝	1 0	10% Feb. '95	1 0 0	100,000	Lydenburg	120, Bishopsgt st. Wn
New Crœsus ... G	2¼ 2⅜	2 5/16 2 7/16	1 0	5 % Aug. '92	1 0 0	255,000	Langlaagte	120, Bishopsgt.st. Wn
New Gordon ... D	6/- 7/-	6/- 7/	1 0	5% Dec. '89	1 0 0	404,344	Griqualand	110, Cannon-street.
New Heriot ... G	11 11¼	11⅛ 11⅜	1 0	25 p c Mar. 95	1 0 0	88,750	Rand ...	96, Gresham Ho. EC
New Jagersf. ... D	10½ 10¾	9¼ 9½	5 0	10% Mar., '95	5 0 0	100,000	Transvaal.	5, Copthall-buildings
N. Kleinfontein G	5⅜ 5⅝	5⅛ 5⅜	1 0	12½pc Mar, '95	1 0 0	82,500	Rand ...	Winchester House.
New Louis D'Or ... G	3/- 3/3	2/6 3/6	1 0	—	1 0 0	—	Rand ...	53, New Broad-street
New Primrose ... G	6 13/16 6 15/16	6⅞ 7	1 0	4/- April	1 0 0	278,750	Rand ...	2, Draper's-gardens.
New Rand ...	par 1/16 pm	par ⅛ pm	1 0	—	1 0 0	110,000	Rand ...	Bartholomew-house
New Rietfontein G	3 11/16 3 13/16	3⅝ 3⅞	1 0	—	1 0 0	160,000	Rand ...	Warnford-ct., E.C.
New S. Augustine D	14/- 15/-	12/- 13/	1 0	—	0 19 6	299,137	Griqu'ld W	30-1, St. Swithin's-ln
New Spes Bona ... G	2 15/16 3 1/16	2⅞ 3	1 0	—	1 0 0	113,701	Rand ...	24, N. John-st., L'pl
New Steyn Estate	2 1/16 2 3/16	1⅞ 2	1 0	—	1 0 0	125,000	Heidelberg	19, Bury Street, E.C
New Virginia ... G	1/6 2/-	1/ 2/	0 10	—	0 10 0	48,335	Transvaal	26, Budge-row, E.C
Nigel ... G	7 7¼	6¾ 7	1 0	10% Mar. '95	1 0 0	160,000	Rand ...	96, Gresham Ho., EC
Nigel Deep ... G	2¾ 2⅞	2 9/16 2 11/16	1 0	—	1 0 0	195,000	Heidelberg	8, Old Jewry.
Nigel Extension ...	10/ 11/6	10/ 11/	10/-	10% June '93	0 10 0	160,000	Rand ...	Basing House, E.C.
North Sheba ...	7/6 8/6	7/6 8/6	—	—	—			88, London Wall.
Nourse Deep ...	5 5⅛	5⅛ 6	1 0	—	1 0 0	375,000	Rand ...	120, Bishopgt.-st. Wn.
Nyassa (Bearer) ...	1 1⅛	1 1⅛	1 0	—	1 0 0	248,585	Mozamb'qu	Bartholomew House
Oceana ...	2 11/16 2 13/16	2⅝ 2¾	1 0	25/- Nov. '89	1 0 0	326,000	Transvaal	4, Sun Court, E.C
Oceana Develpmnt	1⅝ 1 11/16	1⅝ 1 11/16	1 0	—	1 0 0	50,000	Transvaal	4, Sun Court, E.C.
Ophir Concess. ...	3/6 4/6	4/ 5/	1 0	—	0 18 6	111,857	E. C. Africa	31, Lombard-street.
Orange F.S.E. ... D	4¾ 5¼ xd	4¾ 5¼	1 0	12½ % May 95	1 0 0	284,000	OrangeF.S.	10, Moorgate-street.
Orion ... G	3⅛ 3⅜	3 3/16 3 5/16	1 0	10% Mar. '95	1 0 0	30,000	Rand ...	8, Old Jewry.
Otto's Kopje ... D	6/- 6/6	6/ 6/6	1 0	—	1 0 0	437,888	Kimberley	110, Cannon-st., E.C.
Paarl Central ... G	1 5/16 1 7/16	1 1/16 1 3/16	1 0	—	1 0 0	138,750	Transvaal	120, Bishopsgt st. Wn.
Pardy's Mozambq.	2¼ 2⅛	2⅝ 2⅞	0 10	1/- Jan. 95	0 10 0	13,000	S.E. Africa	Broad St. Avenue.
Pardy's Range ...	10/6 11/6	10/6 11/-	0 10	—	0 10 0	—	Manica ...	Broad St. Avenue.
Piggs Peak ... G	⅞ 1	⅞ 1	1 0	—	0 17 6	200,000	Swazieland	6, Queen-street-place
Piggs Peak ... G	—	—	1 0	—	0 17 6	60,652	Swazieland	6, Queen-street-place
Pleiades ...	1⅝ 1¾	1 11/16 1 13/16	1 0	—	1 0 0	140,000	Black Reef	
Potchefstroom ... G	1 1⅛	1 1/16 1 3/16	1 0	—	1 0 0	389,750	Potchefstm	19, Bury-st., E.C.
President Land ...	6/- 8/-	5/3 5/9	1 0	—	1 0 0	193,325	Transvaal	17, Basinghall Street
Princess Estate G	3 3⅜	2⅞ 3	1 0	—	1 0 0	125,000	Rand ...	33, Cornhill, E.C.
Randfontein ... G	42/- 43/-	38/6 39/6	1 0	—	1 0 0	2,000,000	Rand ...	59, Holborn Viaduct.‡
Rand Mines ... G	29⅛ 30	30⅛ 30⅝	1 0	—	1 0 0	332,708	Rand ...	120, Bishopsgt st. Wn‡
Rand-Rhodesia ...	2⅛ 2⅜	2⅛ 2⅜	1 0	—	1 0 0	25,000	R&Rhodesia	Warnford court, E.C.
Read's Drift ... D	1⅞ 2⅛	1¾ 2	1 0	—	1 0 0	37,000	Transvaal	19, Finsbury-circus.
Rhodesia Expln. ...	8⅝ 9⅛	9⅝ 10⅛	1 0	—	1 0 0	50,000	Mt &Mash'l	8, Old Jewry.
Robinson ... G	8⅞ 9	8 9/16 8 11/16	5 0	5/- Jan. '95	5 0 0	550,000	M. Rf.'rand	28, Austin Friars, E.C
Roodepoort Deep	3⅞ 4	3 15/16 4 1/16	1 0	—	1 0 0	170,000	Rand ...	8, Old Jewry, E.C.
Roodepoort (Kim.)	3⅞ 4	3⅝ 3⅞	1 0	—	1 0 0	100,000	Rand ...	7, Lothbury, E.C.
Roodepoort Un. G	5¾ 5⅞	5 9/16 5 11/16	1 0	10p.c. Dec. '94	1 0 0	130,000	Rand ...	Warnford-court.‡
Rose Deep ...	5 5⅛	4¾ 5⅛	1 0	—	1 0 0	300,000	M. Rf.'rand	30-31, S. Switn's. lane.
Rosenblock Tw'Rfs	15/16 1 1/16	15/16 1 1/16	1 0	—	1 0 0	60,000	Krugersdp	4, Tokenhouse bldgs.
Salisbury Gold ...	5⅛ 5⅜	5⅛ 5⅜	1 0	—	1 0 0	98,000	Rand ...	96, Gresham Ho., EC
Sheba ... G	1 13/16 1 15/16	1¾ 1⅞	1 0	1/- Sept. '94	1 0 0	850,000	Lydenburg	18, S. Helen's place.
Silati ... G	10/- 11/-	10/- 11/-	1 0	—	0 18 6	119,000	Zoutpan'bg	4, Sun Court, E.C.
Simmer & Jack ... G	14¾ 15	14¾ 14⅝	1 0	10% Feb. '95	1 0 0	250,000	Rand ...	8, Old Jewry.
S. A. Gold Trust ...	7 13/16 7 15/16	7¾ 8	1 0	6/6 Jan. '95	1 0 0	250,000	S. Africa ...	8, Old Jewry.
Southern Geldnus.	6/3 6/9	7/- 8/	1 0	—	1 0 0	120,000	Elandsfont	6, Great St. Helen's
Southern Land ...	15/ 16/	15/- 16/-	1 0	—	0 15 0	80,000	Griqld. W.	19, St. Swithin's-ln.
Southern Land ...	14/ 15/	14/- 15/-	1 0	—	1 0 0	20,000	& B. Bech	19, St. Swithin's-ln.
South West Rand	1⅛ 1¼	2¼ 2⅜	1 0	—	1 0 0	158,000	Rand ...	Winchester House.
Spitzkop (New) G	1⅜ 1⅛	1⅜ 1⅛	1 0	—	1 0 0	99,070	Lydenburg	15, Bishopsgt-st, Wt.
Stanhope ... G	1 13/16 1 15/16	1 13/16 1 15/16	1 0	20% Jan. '95	1 0 0	34,000	Rand ...	96, Gresham Ho., EC
Sutherland R. ... G	7/- 8/-	12/- 13/-	1 0	—	1 0 0	220,000	Zoutpan'bg	Dashwood Ho.
Teutonia ... G	15/16 1 1/16	⅞ 1	1 0	—	1 0 0	100,000	Rand ...	8, Old Jewry.
Thistle Reef ... G	4/3 4/9	4/3 4/9	0 5	—	0 5 0	547,978	Barberton	Copthall House
Trans. Coal Trust ...	1 11/16 1 13/16	1 7/16 1 9/16	1 0	1/- Mar. '95	1 0 0	439,965	Rand ...	Broad-st. House, E.C
Trans. Est. & Dev.	⅞ 1	⅞ 1	1 0	—	1 0 0	285,700	Transvaal	76, Old Broad-st. E.C.
Trans. Gen. Assoc.	2⅝ 2⅞	2⅛ 2¾	1 0	10% Mar. 95	1 0 0	210,000		30, S. Swithn's lane.
Trans. Gold Exp. G	5⅛ 5⅜	4⅝ 4¾	1 0	1/- Mar. '95	1 0 0	260,000	Transvaal	Suffolk House, E.C
Trans. Gold Fields	3¼ 3⅜	3¼ 3⅝	1 0	—	1 0 0	135,000	S. A. R. ...	120, Bishopsgt-st. Wn
Trans. Land ...	⅝ ⅞	11/16 ¾	1 0	—	1 0 0	79,915	Transvaal	33, Cornhill.
Trans. Land ...	8/ 9/-	8/- 9/-	1 0	—	0 15 0	169,999	Transvaal	33, Cornhill.
Treasury ... G	3⅞ 4⅛	4 4¼	1 0	12½ % Sep. '91	1 0 0	80,000	Rand ...	Warnford Court.
Turffontein Est. ...	—	—	1 0	2½ Nov. 94	1 0 0	41,007	So. Africa ...	130, Winchester Ho.
U. G. F. of Manica	7/- 8/-	8/6 9/6	1 0	—	1 0 0	100,432	Manica ...	Broad Street House.
Un. Ivy Reef ... G	1¼ 1⅜	1¼ 1⅜	1 0	2½ Jan. '94	1 0 0	45,010	Transvaal	110, Cannon-street
U. Langlaagte (N) G	3¼ 3⅜	3¼ 3⅜	1 0	—	1 0 0	146,000	Rand ...	118, Bishopsgt-st Wn‡
United Matabele ...	1⅛ 1¼	1⅛ 1⅜	1 0	—	1 0 0	75,000	Africa ...	19, S. Swithin's lane.
United Pioneer ...	1 1/16 1 3/16	1 7/16 1 9/16	1 0	—	1 0 0	75,000	De Kaap ...	16, S. Helen's-pl, E.C.
Van Ryn ... G	8¾ 9	8⅞ 9	1 0	—	1 0 0	160,000	Rand ...	18, St. Swithin's-ln.
Village Main Reef	6⅛ 6⅜	6 6¼	1 0	—	1 0 0	177,000	Rand ...	8, Old Jewry.
Wassau ... G	—	—	1 0	—	1 0 0	190,000	Gold Coast	147, Cannon-street.
Wemmer ... G	11⅛ 11⅜	10⅞ 11⅛	1 0	10% Nov. '91	1 0 0	55,000	Rand ...	19, Bury-street.‡†
West Rand ... G	2⅛ 2¼	2⅜ 2⅝	1 0	—	1 0 0	240,000	Rand ...	8, Old Jewry.
Willoughby's Con	1 1/16 1 3/16	1 3/16 1 5/16	1 0	—	1 0 0	700,000	Mashonald	3, Copthall-bldgs.
Witwatersrand G	8¼ 8⅜	7¼ 7½	1 0	—	1 0 0	250,000	Rand ...	19, Bury-st., E.C.
Wolhuter ... G	7⅛ 7⅜	6⅞ 7⅛	1 0	10 p c Apr., '94	1 0 0	130,000	Rand ...	Warnford-court.†
Wolverand ... G	⅞ 1	⅞ 1	1 0	2/- Apr., 94	1 0 0	18,750	Transvaal	Blomfield House.
Wolverand ... G	—	—	1 0	—	0 18 0	39,021	Transvaal	Blomfield House.
Worcester ... G	4¼ 4½	4⅜ 4⅝	1 0	15% Apr. '95	1 0 0	90,727	Rand ...	8, Old Jewry.‡
Zambesia Explors.	3 3¼	3 3¼	1 0	—	1 0 0	65,000	Transvaal	13, George-st., E.C.

MINING IN CORNWALL

AND DEVON:

NOTES ON MINING IN THE WEST.

(BY OUR SPECIAL CORRESPONDENT).

The fluctuations in the tin market have had a reflex action on the price of shares, and the variations during the past week have been considerable, though, at the time of writing, the market is fairly steady. Although the price of metal shows a considerable drop from the highest point it has touched in this little spurt, prices all round exhibit a marked improvement compared with what they were with tin at the same figure before the activity set in on the metal market. We understand that a large number of the orders that have recently been placed in the hands of local brokers have come from London, many of them from members of the Stock Exchange. This is regarded as significant, in view of the conversion of Dolcoath, and the possibility of other mines following. This is thought to be an indication that London speculators are inclined to look with favour on the new development in Cornish mining, and that they will not hesitate to show that they were sincere in the advice they have often given to bodies of adventurers in the county to bring themselves into line with the rest of the world in the matter of company management. The amount of business has been somewhat smaller this week, owing probably to the fact that holders are still disinclined to sell, and that buyers, in the face of the uncertainty of the tin market, do not care to give much above the quoted prices.

Some little consternation was caused on the Exchange on Tuesday evening by the posting of an official notice from Dolcoath Mine intimating that the company having been registered as an unlimited company, the *ad valorem* stamp duty would have to be paid on all transfers. There have been a large number of deals in Dolcoaths recently, and buyers have scarcely reckoned on having to pay 11s. 6d. a share stamp duty. Some difficulty was experienced in registering the company, arising probably from the fact that this is the first transaction of the kind. There had to be a reference to the Board of Trade, and the registration was ultimately effected. The next step will be to wind-up the affairs of the company, appoint a liquidator, and authorise him to enter into an agreement with the new company, and for this purpose a special meeting has been convened for Thursday next. As the conversion is practically a *fait accompli*, it is to be hoped that those who have hitherto opposed it will not persist in tactics which, at this stage of the proceedings, could only be described as obstruction.

Practical men are already discussing a suggestion which has been thrown out that the new capitalists may possibly desire that the shaft to be sunk to the south of the present workings should be round instead of rectangular, as most shafts in British metalliferous mines hitherto have been. Cornish miners can scarcely be expected to adopt off-hand a system which must be more or less of the nature of an experiment in the place of that which has prevailed in the county from time immemorial, and has never been seriously assailed by the most critical of experts. Advantages are claimed for both. For the round shaft it is maintained that the very accidents to which the Dolcoath has been subject (the running-together of the shaft) will be avoided by the adoption of the circular form, but those who favour the existing form point out that where probably hauling and pumping and a variety of things may have to be done in the one shaft, its form will allow these operations with greater convenience. That, however, is a question which has not yet been seriously considered, though it is one which the new directors, when appointed, will have to take in hand without delay.

What has become of the negotiations between South Frances and Wheal Basset? Shareholders in both mines will remember that at the recent meeting suggestions were made for amalgamation, and the committees were empowered to continue the negotiations which they had themselves opened up, and to report to an early meeting of the shareholders. Five weeks have elapsed, and the shareholders have received no information. Some very pointed questions are being asked as to the possibility of a settlement.

EAST POOL meeting on Whit Monday will be more than commonly interesting on account of the discussion which will probably take place on the position of affairs as affected by the decision of the Wheal Agar adventurers. It might be well for the shareholders to consider the question of strengthening the committee for the purpose of dealing with so important a subject.

MINING NOTES FROM JOHANNESBURG.

By H. BUSH, M.E.

(Cabled Weekly).

Randfontein Estate.

The actual gold-bearing virgin claims on the Randfontein leader and reef that have been proved to be payable (that is, from the southern boundary of Nitralfontein to the northern boundary of mynpacht No. 204, near the George and May) are 1380 claims, which are capitalised at under £3500 per claim, whilst claims with the same grade of ore (viz., 14 dwts.) on the Rand are capitalised at from £10,000 to £15,000 per claim. There is every chance of not only this 14 dwts. return being kept up, but the profits will be increased in the immediate future. As the ore is worth £2 11s. 6d. per ton, a profit of 20s. per ton can be expected. The reefs through the Estate give at an angle of 70°, but to be on the safe side we take the average dip at 60° right through the property. The leader at present is only being worked, and out of a 2 feet stope 25 per cent. of the waste is being sorted, so on this basis this will give 12,000 tons for each claim, or 16,200,000 tons of payable ore in the property; but in justice to the company it is only fair to state that this estimate is under the mark, as it is almost certain that portions of the big reef will be found payable, and increase the tonnage considerably; and then again, there are a dozen series of reefs running through the Estate, some of which may turn out payable as development proceeds. I have not reckoned upon more than one-half of the company's holdings, but only upon that which I know to be payable. To the south is the mynpacht of the farm Middle Vlei, and it would not be overestimated at 1,000,000 sterling, as there are the whole of the series that are found in the Witwatersrand basin in this property, owing to the whole series coming together where the reefs again have an east and west course. There are eight farms, comprising about 31,000 acres, all of which are gold-bearing, and any reefs that are opened up on the gold belt must pass through one or the other of these farms; and when one comes to consider the fact that this estate has eight gold-bearing farms (from which the rents will soon be enormous), Middle Vlei mynpacht, and several hundreds of outside claims, and 1350 claims that are certainly worth 10,000,000 sterling.

Steyn Estate.

About 100 claims are actually gold bearing, and as the extraction from the mill and cyanide should be about 12 dwts., the ore will be worth about 40s. per ton, and the expenses should not be more than 25s. per ton, leaving a profit of 15s. per ton, or a profit of £12,000 in each claim. This mine is now capitalised under £3000 per claim. The mine has been under a cloud and a puzzle to the management, owing to the reef dipping north and lying on a diorite dyke, which was penetrated to find the reef on the other side of it, but as the dyke took a dip to the south, so also did the reef, which has now a diorite foot-wall and a quartzite hanging-wall, so this is the only contact banket reef in Africa. Owing to its peculiar formation this mine can be expected to give many suprises, and probably rich patches. Besides this mine, the Estate Company owns the farm Vlakfontein of 3500 acres, and also a large mynpacht of about 700 claims, when the Main reef will be struck at a depth of 2000 feet. The directors are also buying up the claims adjoining the mynpacht, and a borehole is to be started to strike the reef, so this is a very valuable asset to the company.

South West Rand Company (late Madeline Gold Mining Company).

The Steyn Estate reef is opened up on the surface, but only shows 5 to 6 dwts.; may improve at depth.

Dornkops Gold Mining Company.

Steyn reef going good towards this mine, which will be rich, but they have a very small block on the reef.

Vogelstruis Mine.

Active development is going on throughout this mine, with very good results. The leader is from 2 to 9 inches in width, and gives pannings of fully 5 ounces, and from a 2 feet stope a return of 11 dwts. can be expected. The Main reef leader is good for 8 dwts., and there is not the slightest doubt but that this will be a big mine.

George and May.

Direct cyanide process a great success, Main reef that only assays 8 dwts. being treated at 73 per cent. extraction being obtained at a cost of about 11s. per ton. This mine should pay dividends in the future.

West Rand Mines.

Excellent pannings are being obtained from the Sydney series.

Luipaard's Vlei Estates.

Better prospects are being obtained, but they are only fair as yet.

Rosenblock Twin Reefs.

Shaft down 80 feet; expect to strike reef at 200 feet. Prospects of the company fair, but afraid insufficient working capital to make a mine of it.

Middle Vlei Black Reef Syndicate.

Prospects fair as a Black reef proposition.

Midas Estates.

Thirty pennyweights pannings are being obtained from the black reef. This company is in the hands of French engineers, and the 10-stamp battery is to be started in a few weeks, when excellent returns will be made.

Anglo-French Exploration Company.

The assets of this company are large and valuable, and they could easily declare a cash dividend of £3 per share.

WESTERN AUSTRALIA'S MARCH GOLD OUTPUT:—

	Ozs.	dwts.	grs.				
Coolgardie	9,309	15	13	at	£35,376	15	0
Yilgarn	5,402	6	7	„	20,083	7	10
Murchison	4,810	18	3	„	18,281	8	10
Ashburton	29	12	1	„	112	9	10
March total ...	19,619	10	0	„	£74,554	2	0
Feb. „ ...	15,509	2	23	„	58,934	15	3
Increase	4,110	7	1	„	£15,619	6	9

LISTS will be OPENED on MONDAY, May 27th and CLOSE at or before 4 p.m., TUESDAY, May 28th, 1895.

RICHARD SPRATT, Consulting Engineer of the WAIHI GOLD MINING COMPANY (LIMITED), on 25th March last, in reply to a cablegram from Messrs. Keeping and Gloag, the Company's Solicitors, cabled *inter alia* that the present position and future prospects of the property were most encouraging, and that great facilities exist for working the ore cheaply.—*Vide Cablegram below.*

Extract from Report of JAMES THOMAS, New Zealand, *Mining Engineer*, 14th *February*, 1895.

"The Property contains a network of Gold-bearing Lodes. The Big Main Lode runs north-east and south-west, dipping west, varying in size from 10 to 50 feet wide. . . . the deep adit may be expected to open up backs to a height to surface of 757 feet, which would give an estimated output of 824,855 tons of Quartz. Estimating its general yield at only half-an-ounce of Gold per ton, at £2 10s. per ounce, gives about £1,000,000 in value that can be raised and milled without the expense of steam machinery."

THE

TRIUMPH (HAURAKI) GOLD MINES,

LIMITED, NEW ZEALAND.

(Incorporated under the Companies Acts, 1862 to 1890.)

Capital ... ... £100,000.

Divided into 400,000 Shares of 5s. each.

The Vendor will accept 140,000 Shares (fully-paid) as part payment under his contract.

200,000 Shares are now offered for Public Subscription at par.

Payable 1s. per Share on Application,
1s. „ on Allotment,
1s. „ on the 15th July,

And the balance in calls not exceeding 1s., at intervals of not less than one month.

(£15,000 will be devoted to Working Capital, and a further £15,000 will be held for future issue, if and as deemed requisite by the Directors.)

DIRECTORS.

SIR C. F. CUNNINGHAME, BART., 202, Piccadilly, W.
C. E. HOGG, C.E., 1, St. Helen's Place, E.C.
CURWEN SISTERSON, Chairman of the Wolverand Gold Mines (Limited).
J. H. WITHEFORD, Director of The Royal Oak of Hauraki (Limited), Auckland, New Zealand.

BROKERS.

WM. R. HARTRIDGE and CO., 5, Drapers' Gardens, and Stock Exchange, London, E.C.

SOLICITORS.

KEEPING and GLOAG, 26, Lombard Street, London, E.C.
GREVILLE and WHITE, 60, Haymarket, London, S.W.

BANKERS.

BROWN, JANSON, and CO., 37, Abchurch Lane, London, E.C.
CHAS. HOPKINSON, and SONS, 3, Regent Street, W.
The NATIONAL BANK of NEW ZEALAND, 71, Old Broad Street, London, E.C., and Auckland.

AUDITORS.

FORD, RHODES, and FORD, 23, College Hill, London.

SECRETARY AND OFFICES.

E. N. DAWE, Blomfield House, 52, New Broad Street, London, E.C.

PROSPECTUS.

This Company has been formed for the purpose of acquiring the property known as the Triumph Gold Mine, of about 30 acres, held under license from the New Zealand Government, together with a valuable water-right. The Company has also the option to purchase the adjoining 60 acres.

SITUATION.

Standing 1326 feet above the level of the sea, the property is distant about 5 miles from the landing wharf at Coromandel Harbour, where Vessels can discharge materials and machinery at all times. It is situate in the great auriferous belt of the Coromandel Gold Fields, which contains the celebrated Tokatea, Royal Oak, and other mines.

WATER.

A very valuable water-right has been secured, which has been estimated to give sufficient power to drive 200 head of stamps when required.

TIMBER.

PATRICK BARRY reports there is an abundance of timber for all purposes.

LABOUR.

JAMES THOMAS states that labour is abundant at the lowest Colonial rates.

REPORTS.

The property has been reported on by the following:—

RICHARD SPRATT (Consulting Engineer of the Waihi Gold Mining Company, Limited), JAMES THOMAS (Mining Engineer), PATRICK BARRY (Mill Manager), and GEORGE STEVENS (Mine Manager), and it is from these reports that the particulars in this Prospectus are given.

GEORGE STEVENS, in his Report, says:—

"I beg to state the property is on the same line of reef as the Coromandel Gold and Kapanga Companies are, and about two and a-half miles from the latter, and on the top of the Coromandel ranges; at the head of Paul's Creek, where myself and others others obtained some very rich specimens in the early days of this gold field, which on being crushed yielded 5 ounces to the pound Troy weight.

"I consider this one of the most valuable properties in this district, and can be worked with little expense, as there is no sinking required."

Mr. PATRICK BARRY, in his report, says:—

"This mine is situated on the Tokatea Main Range, about half a mile in a northerly direction from the 'Tokatea' Company's property at the head of Paul's Creek, from which such exceedingly rich specimens were obtained.

"The position of the 'Triumph' is well situated, with plenty of mining and other useful timber at hand. I have no hesitation in saying that a few thousands pounds judiciously spent, this ground might be developed into one of the most valuable properties on these Gold Fields."

JAMES THOMAS, in his Report dated 14th February, 1895, says:—

"The property contains a network of gold-bearing lodes; the big main lode runs north-east and south-west, dipping west, varying in size from 10 to 50 feet wide.

"Branching off from the big lode, several east and west lodes are found dipping east, varying in size from 1 to 3 feet wide, producing specimen stone which yields from 1 to 6 ounces of gold to the pound weight of quartz. A mill return of 53 tons of general quartz taken from these lodes, together with 381 ounces of selected specimens, gave a yield of nearly 7 ounces of melted gold per ton, realising at the bank £1109 16s.

"The lodes have only been slightly tested about their outcrops and by a few shallow adits done by poor men from which they have obtained £3000 to £4000 worth of gold.

"The ore at present explored 199 feet below the surface, for immediate extraction above the prospecting adits, Nos. 1, 2, and 3, will yield large quantities at once for milling returns, and, in the meantime, the proposed new deep adits, Nos. 4 and 5, should be driven by 'Rock Drill,' to intersect the whole series of reefs, the deep adit opening up backs to a vertical height to surface of 757 feet, which would give an estimated output of 824,855 tons of quartz. Estimating its general yield at only half an ounce of gold per ton, at £2 10s. per ounce, gives about £1,000,000 in value that can be raised and milled without the expense of steam machinery."

"At the Junction of the 'Triumph Creeks' with the 'Great Paul's Creek' there is unlimited water-power, available in all seasons of the year, sufficient to drive 200 stamps, air compressors, or other machinery, by turbines or other water-wheels.

"The quartz, as it is broken from the workings, can be delivered by tramway from each adit direct into the mill hoppers, and the cost of mining and milling would only average from 9s. to 10s. per ton. There is practically an unlimited supply of quartz when the deep adit is driven to intersect the lodes.

"Timber suitable for all purposes is abundant on the property, and the carriage of machinery or materials from Auckland to Coromandel is only 3s. to 4s. per ton.

"The Tokatea Mine is situate on the same line of reef and is in proximity to the Triumph.

"In 1871 the Tokatea Company milled under my supervision 944 tons of quartz, which gave a yield of 7¾ oz. of melted gold per ton, and in 1875 1670 tons of quartz yielding 3½ oz. per ton. This mine has produced and sold over £150,000 worth of gold. The other adjoining mines, the 'Royal Oak' has sold £7,000; 'Harbour View,' £20,000; 'Bismark,' £13,000; with many other mines surrounding have proved very rich. The average yield of quarts throughout the field has been proved to have 3¼ oz. of gold per ton of quartz milled.

"I have known and visited the 'Triumph' property shortly after its discovery, and seeing its magnificent situation, possessing so many valuable natural advantages and facilities for the cheap and ready development of its vast resources, to make early, large, certain and continuous returns for a lifetime, without going to the expense of steam machinery for pumping, winding, or milling, or the sinking of expensive shafts. I consider this property is one of the safest gold mining investments I have met with or seen, either in New Zealand, Australia, Tasmania, or America, and I can safely and truly recommend it to investors who can command a small capital to provide the necessary machinery by water power for reducing and returning the enormous quantities of rich quartz that is discovered and its quality proved, only waiting to be utilised and turned to money."

RICHARD SPRATT cables as follows:—

(Copy.) "25 March, 1895.

"To GLOAG, London.

"I have carefully examined the property, Tierney's Triumph. The old workings have caved and are inaccessible—present position and future prospects most encouraging—great facilities exist for working the ore cheaply. It would be as well to take up one hundred acres.

"SPRATT."

Particular attention is requested to the plans of the property enclosed herein.

The following contracts have been entered into:—(1) Dated 19th April, 1895, between Peter Joseph Tierney by George Baldock, his Attorney, and the New Securities Corporation (Limited), who are the Vendors to, and Promoters of, this Company. (2) Dated 24th May, 1895, between the New Securities Corporation (Limited) and the Company. The Vendors and Promoters pay all the expenses of the formation and incorporation of the Company down to the first allotment of its Share Capital.

The purchase price has been fixed at £70,000, payable as to £25,000 in cash, £35,000 in Shares, and the balance £10,000 in cash or Shares at the option of the Directors, thus leaving £30,000 for Working Capital, half of which is to be first set aside out of the subscriptions received.

There are other agreements entered into by the Vendors as to the promotion of the Company and subscription of its Capital and otherwise, to which the Company is not a party, which are or may be contracts within the meaning of the 38th Section of the Companies Act, 1867. Applicants shall be deemed to have had full notice of such agreements, and to have agreed with the Company as Trustees for the Directors and other persons interested to waive any further compliance with that section or otherwise, and also to waive all claims for compensation under the Directors' Liability Act, 1890, in respect of any misstatement made in the belief that it was true, and subscriptions are received upon that condition only.

The originals of the Reports can be seen at the office of the Company's Solicitors, Messrs. Keeping and Gloag, where the above Contracts and copies of the Memorandum and Articles of Association can be inspected.

Applications for Shares should be made on the Form accompanying this Prospectus, and together with a deposit of 1s. per Share, should be forwarded to the Bankers of the Company, Messrs. Brown, Janson and Co., and Messrs. Charles Hopkinson and Sons, to whom cheques should be made payable.

Prospectuses and Forms of Application for Shares may be obtained from the Bankers, Brokers, Solicitors, or Secretary to the Company.

If no Allotment be made, all application money will be returned in full.

LONDON, *May 24th*, 1895.

WEST AUSTRALIAN MINING COMPANY.—The third annual general meeting of the shareholders in the West Australian Mining Company (Limited) was held on Tuesday, at Winchester House.—Mr. G. T. Bean, who presided, said that though the working capital of the company was only £4000, they had made a profit of £20,000. The first property handled by the company was the West Mallina, which had since been amalgamated with the Consolidated Gold Mines of West Australia, a powerful company, having a working capital of £105,000, and plant and machinery already on the ground. The next venture was the North Croesus, and they had also been instrumental in the formation of the Murchison gold fields, which was a prosperous company, and whose shares had been quoted at a premium from the commencement. The amount of business transacted by the company, upon which such large profits had been made, had been limited by the amount of working capital at their command, and accordingly they now came before the shareholders with a new scheme, under which the capital of the company would be reduced from £120,000 to £80,000, in 320,000 shares of 5s. each, and the present shareholders would receive one share for every share now held. This would represent £26,000, leaving £54,000 available for working capital. The Chairman concluded by moving the adoption of the report and accounts.—Sir James Mackenzie seconded the motion, which was carried unanimously.—Subsequently an extraordinary general meeting was held, at which the scheme of reconstruction submitted by the directors was adopted.

LADY MARY AMALGAMATED.—This property, which is within a few hundred yards of Cue, includes the original leases of the Lady Mary and the Rising Sun, from both of which considerable quantities of gold were dollied in the pre-battery days. They were acquired by Mr. Fell on behalf of his syndicate, and since passing into the new ownership commendable enterprise has been shown in opening up and developing the property. While the manager, Mr. Lewis, was away in Melbourne selecting machinery, the control of operations devolved upon Mr. George Wycliffe, and he has certainly made excellent progress. On the Lady Mary block the main shaft has been sunk to 106 feet, at which depth water has been tapped, and it is of excellent quality. On the Rising Sun block the underlay shaft has been cut down to 80 feet, and sunk a further depth of 20 feet, making about 100 feet in all. It is intended to put down a tram, and haul up the stone by trucks, as in the Cue Victory Mine at Day Dawn. Two reservoirs, each with a capacity of 286 cubic feet, have been excavated, and in every direction it is clear that business is meant. The machinery is now on the road up from Mullewa.—*Murchison Times.*

THE HAURAKI MINE.—The Coromandel correspondent of the *New Zealand Herald* says: "The excitement noticeable last month is very much intensified at the present time. The magnificent return of over 600 ounces of melted gold for an ordinary month's work in the Hauraki Mine seems to have taken everybody by surprise. No doubt the late manager, Captain Argall, made as good a record as he could before leaving the mine, but there was no undue gouging or fossicking, and the mine was fairly worked. But he was wonderfully favoured. In driving along the reef he got several large patches of very rich stone, both in Nos. 2 and 3 reefs, and although the stopes have not been turning out quite such rich stone, still they have a good deal of it, and there will be a good return for the month. The shaft is now sunk to about the required depth for another level, and I feel confident it will be equally rich (I would almost say richer) than the last. Everything is now in splendid working order, and there is nothing to hinder good returns for many months to come."

ANOTHER GOLD-SAVING INVENTION.—This mail's *New Zealand Herald* states that an important gold-saving invention has just been patented by Mr. O. C Heiden, of Wellington, who has over 40 years' experience as a mine manager, and has also been mining expert to the Tasmanian Government. He has for several years made a study of electrolysis in the saving of gold, and his efforts have at last been successful. Mr. Heiden's process provides for an electrical chemical action, which will electrolyse every particle of gold in the fluent ore in its passage through the apparatus, keep the electro negative mercury both bright and active, and absorb all free or dissolved gold or silver. His amalgamating apparatus provides for cleaning the mercury bath, and by well-balanced gravitation, forcing through it pulverised ore or pulp, or auriferous river sand from stones or gravel, or auriferous ocean beach sand, which the electro-magnets will separate iron sand from. A special apparatus is provided to ensure that ore rushing through the bath will come into intimate contact with the mercury, so that all the gold and silver may be saved. A continual flow of hydrogen or sodium is maintained through the bath by an electric action process, being self-acting and inexpensive. Provision is made for the use of a weak solution of cyanide of potassium in the case of refractory ores which cannot be otherwise treated, and by the electrolysis process the cyanide process, which at present occupies some days, is reduced to a few hours.

STAR OF THE EAST.—The statutory general meeting of the shareholders in the Star of the East Gold Mining Company was held on Tuesday, at Winchester House.—Major-General J. Shaw-Stewart, who presided, said the company was registered on January 28, and went to allotment on February 1. The transfer of the property was effected on February 27, the company taking everything over from the old company from January 26. On April 9 they received the following cablegram:—"Crushing in first-rate style; the mine is in full work." On May 1 they received another cablegram:—"The result of the last clean-up was 450 tons crushed, yielding 425 ounces; 16 days' crushing, ending April 27." Since then they received on the 17th the following message:—"Cleaned-up, May 11; total amount crushed, 350 tons, yielded 196 ounces gold; developments in the lower levels look encouraging; main shaft is down 51 feet; water level has been reached; both boilers arrived; machinery works well." These two crushings were certainly unsatisfactory, especially in view of the calculation made in the prospectus on the basis of the yield of gold being 2 ounces per ton. These figures, however, could hardly be taken as giving a fair estimate of the value of the company's property. In fact, until they had got rid of the poor stone left in by the old company they might expect to have low crushings.—The Hon. H. J. Saunders having spoken very hopefully of the future of the mine, the proceedings terminated in the usual manner.

NEW ISSUES.

THE MINES SELECTION COMPANY (LIMITED).

This company has been formed with a capital of £200,000, in 200,000 shares of £1 each, "for the purpose of acquiring and carrying on the undertaking and business of the Mines Selection Syndicate (Limited), and of extending its scale of operations. The management of the company will be practically the same as that of the vendor syndicate, which has successfully carried on the business of a mining exploration and investment company. The Mining Selection Syndicate was registered on June 1, 1892, with a capital of £50,000 in £1 shares. A first issue of 15,456 shares was made, and 10s. called up on the same giving an original working capital of £7728, and on this amount a dividend of 25 per cent. has been paid. Subsequently a further issue of 4544 shares with 10s. paid-up was made, at a premium of 5s. per share."

The prospectus tersely sums up the prospects of the company in the following terms:—"With the independent and reliable information at the disposal of the company, it is anticipated that profitable investments can at times be made in new ventures, or in established mines. These special sources of information make mining investment by a properly-managed company safer in character than if carried out by the ordinary investor. The operations of the company will not be confined to any one country, but rather the attempt made to acquire interests in different districts with a view to averaging the risks unavoidably attendant on mining enterprises. Particular attention will be devoted to South Africa and Australia, in both of which countries the vendor syndicate has successfully operated, and where the company has made arrangements for being properly represented."

The following further quotation from the prospectus may be made:—"It is anticipated that Mr. R. J. Frecheville, who has been for some years professionally engaged in Johannesburg, will shortly return there and will act for the company. Opportunities have occurred to the vendor syndicate of participating in the reconstruction of mining companies possessing valuable properties, and requiring additional working capital, but the limited scale of operations in the past prevented such occasions being utilised, as they can be with the larger capital of this company."

THE TRIUMPH (HAURAKI) GOLD MINES (LIMITED), NEW ZEALAND.

Reference to our advertisement pages will inform readers that the above is the title of a new company, formed with a capital of £100,000, divided into 400,000 shares of 5s. each. This new company has been formed for the purpose of acquiring the property known as the Triumph Gold Mine, of about 30 acres, held under license, as the prospectus states, from the New Zealand Government, "together with a valuable water right." The company has also the option to purchase the adjoining 60 acres. Standing 1386 feet above the level of the sea, the property is distant about 5 miles from the landing wharf at Coromandel harbour, where vessels can discharge materials and machinery at all times.

Reports on the property of a favourable character have been made by several experts. Mr. George Stevens says:—"The property is on the same line of reef as the Coromandel Gold and Kapanga Companies are. I consider this one of the most valuable properties in this district, and can be worked with little expense, as there is no sinking capital." Mr. Patrick Barry states:—"The position of the 'Triumph' is well situated, with plenty of mining and other useful timber at hand. I have no hesitation in saying that a few thousand pounds judiciously spent, this ground might be developed into one of the most valuable properties on these gold fields." Mr. John Thomas says:—"I consider this property one of the safest gold mining investments I have ever met with or seen, either in New Zealand, Australia, Tasmania, or America." Mr. Richard Spratt, consulting engineer of the Waihi Gold Mining Company, cables that the present position and future prospects are most encouraging, and that great facilities exist for working the ore cheaply.

REPORTS FROM THE MINES.

We find it necessary to announce that, owing to the vast numbers of mines, reports, and items of mining intelligence which reach us invariably very late—up to, and frequently after the time of going to press—it is impossible to guarantee the insertion of all of them in the issue in which, in ordinary course they should appear. We always endeavour, however, to make this important feature as complete as possible, and if the secretaries of mining companies, mining captains, and others would kindly make an effort to let their reports, etc., reach us early on Fridays, when it is not possible to let us have them earlier in the week, their doing so would go far to ensure their insertion, and to promote the completeness of our Mining Intelligence.

BRITISH MINES.

HOLCOMB VALLEY.—The manager writes under date May 2 that he was then immediately starting the shovel to make the initial cut on the new bed of gravel, and to remove the overlying earth, especially as the manager states in his letter:—"So far as I can judge at present I shall not require much, if any more, money, and think shall be able to remit you ere long. Just how long it will take to make this first cut it is difficult to say, but as soon as it is done the modified amalgamation will be coupled on to the shovel, and dirt will be washed." He has since cabled that the shovel has been doing good work continuously since May 6, and the board hope that these preliminary works will soon be finished.

LEADHILLS.—W. H. Paull, May 20: Brown's vein: The vein in the 160 fathom level going north of Jeffrey's shaft is 4 feet wide, chiefly composed of spar and stone spotted with lead ore. In No. 2 winze, sinking below the 145 fathom level south of Wilson's shaft, the vein has become smaller, now 4 feet wide, and producing but little ore. Nos. 3 and 4 stopes over the 145 fathom level north of Jeffrey's shaft are worth 25 and 30 cwts. of ore per fathom respectively. The vein in the 100 fathom level going south of Wilson's shaft continues much the same in character, and forebreast wet. In crosscut east at the 100, south of Wilson's shaft, the ground is without any particular change calling for remark. The 85 fathom level south of Wilson's shaft is holed to winze below the 70, vein here 4 feet wide, still unproductive, but contains more spar. The various stopes throughout the mines are yielding about their usual quantities of ore. Sarrowcole vein, in Gripp's adit going southwards, continues of a promising character, and contains a strong mixture of spar interspersed with lead ore, but not sufficient to value. Surface works proceeding as usual.

POLBERRO.—May 18: The shaft has improved in the last few feet sinking, and more branches have come in from the north, some of them yielding good stones of tin. We expect by Thursday next to have the new skip working, after which we shall be able to considerably increase the speed in sinking. While putting in the skiproad we have taken the opportunity to repair the engine shaft and ladder road where required, and put in some new dividings. The whole is now in first rate condition.—Charles Thomas, John Harper.

WEARDALE LEAD.—Report on Weardale Company's Mines for week ending May 18: Groverake. Adamson's drift west suspended at present. Groverake cubic fathom stopes worth 12 and 18 cwts. per fathom. Groverake tribute ore for the week, 15 bings.—Boltsburn. Stopes in flats north from Watt's level worth 16, 24 and 30 cwts. per fathom. South flats worth 34, 36, 34 and 20 cwts. per fathom. Driving east to prove south flat; the ground contains rather more spar and a little more ore, worth 16 cwts. per fathom. The crosscut from Watt's level to ventilate north flats has been holed to north flat workings, and a crosscut will now be started to the south.—Greenlaws. Nattrass Gill drift, no change; forehead worth 16 cwts. per fathom. Under stope in Nattrass Gill hazel worth 14 cwts. per fathom.—Lowe's drift. Crosscut north in plate under slatey hazel drifting east, vein 4 feet wide of spar mixed with ore, worth 12 cwts. per fathom.—Walton's stope worth 14 cwts. per fathom.—Race's drift. Vein composed of Plate rider and spar, worth 12 cwts. per fathom. Quarry level vein not looking so well for ore, but improves in roof.—Greenlaws. Tribute ore from the week 13 bings.—Sedling. Driving 64 level east vein worth 10 cwts. per fathom. Stopes above 64 level east worth 12, 12, 16, and 10 cwts. per fathom. Stopes above 64 level west worth 10 and 16 cwts. per fathom. Stopes above 56 level, very strong vein, chiefly spar mixed with ore, worth 14 cwts. per fathom. Ore raised for week 46 tons, ore dressed for week 75 tons, ore and slag smelted for the week 138 tons, producing 79 tons of pig lead.

WEST KITTY.—St. Agnes, Scorrier, Cornwall, May 23: The 108 fathom level west the lode is small producing good stones of tin. The 94 fathom level west the lode is worth £7 per fathom. The 84 fathom level west the lode is 4 to 5 feet wide, and worth for tin £14 per fathom. The 60 end west is yielding a little tin, but not to value. The 60 end east south of slide is worth £12 per fathom. The 60 end west south of slide is slide is worth £12 per fathom. No. 2 rise in back of 60 east of crosscut is worth £11 per fathom. The 50 end east south of slide is worth £7 per fathom. The 50 end west south of slide is worth £8 per fathom. Our stopes and tribute pitches continue to yield the usual quantity of tin. We are making good progress in sinking Thomas's shaft, and are hoping to sink more than 5 fathoms this month.—(Signed) John Williams, Joel Hooper.

COLONIAL, INDIAN, AND FOREIGN.

BREMNAES.—The manager reports, May 15: Section 4. The 200 north and south, 300 and 400 north levels, are in very promising lodes—in fact, the mine has the appearance of being in a position in a very short period to produce a large quantity of very good quartz. There can be no doubt, as we have always stated, that future developments will open up a valuable mine.

DON PEDRO.—Mr. Harvey, in a preliminary report on reduction, states that "a complete reorganisation of the work is necessary, and may be expected to result in a large increase in the outturn of gold as well as saving of labour." He will report further after certain experiments have been carried out.

KLERKSDORP GOLD AND DIAMOND.—Extract from the manager's letter, dated Klerksdorp, April 27:—"I have a very high opinion of the property, and anticipate that, with the cheap method of working I intend to adopt, very handsome profits will be made. Another sample of the core taken from a depth of 523 feet has been assayed by the Bank of Africa, and gave 18 dwt. 6 grains."

LA YESCA.—Mr. Winwood Smith's report dated 1st inst. states: El Despacho. Width of lode 3 feet 3 inches, averaging 76 ounces per ton when dressed.—La Garita. No work done except timbering.—Sans Luis. Rich ore opening up.—San Miguel. Struck lode, ore not yet assayed.—Mill. Crusher has now run 27 hours reducing 22 tons. Will have to be stopped to-morrow pending erection of blanket tables and treatment of tailings. Have started mill to give result as soon as possible, but there will be a considerable loss in tailings as I have no means at present of saving them. The result I calculate will be £1400 per month, making a net profit of £1100.

LADY LOCH.—The manager (Mr. R. M. McCracken) writing from Coolgardie under date April 15, reports as follows:—The east drive has been driven 5 feet for the week, making a total of 13 feet from the shaft, the reef widening out from 2 feet 6 inches to 4 feet, well defined and showing fair gold. The reef in this drive is settled, and when I get in 100 feet I will sink a winze, and have no doubt of striking good gold. Main shaft sunk 18 feet. I hope to see this shaft down in about six weeks. I took possession of the Lady Forrest on the 9th inst. I have kept men at work sinking another shaft on the hanging-wall side of the reef, with a view to making it the main shaft, as it would stand good to work out a very large portion of the reef when cut at a depth. There is a reef running through the block bearing a few degrees east of north. The reef is 4 feet wide and stripped on the surface a distance of 40 yards, and proved to carry payable gold the full distance. There are four shafts on the ground—two vertical and two underlay. There are about 600 tons of stone at grass ready for a battery. Gold is to be seen freely in the stone, and a few men could raise as much more as required to keep 20 stampers at work. I consider there are about 12,000 tons of payable stone in sight.

NEW SPES BONA.—Advices have been received stating that work at this property is being pushed on with the greatest vigour with a view to an early commencement of crushing, which it is expected will be of a highly satisfactory nature. Prospecting shaft at east mine down 80 feet, and the regular reef is expected to be met very shortly. Main reef leader, east of crosscut, bottom of shaft, gives good assays, viz., 6 ounces 3 dwts. 12 grains, and 1 ounce 15 dwts., the reef being of good thickness. The hauling by bucket has now been discontinued, the cage having been run to the bottom level, so that much greater progress will be made than hitherto.

NEW LONDON ESTATES.—Extract from manager's report dated May 12: I am pleased to be able to report very satisfactory progress in the work during the past week.—Erection of plant. I have taken down the engine hoist, &c., from the upcast shaft, and moved the same over to the Ross shaft ready for erection, this plant being of old-fashioned make was, consequently, exceptionally heavy, the fly-wheel alone weighing 12,000 lbs. The hoist foundations are built up ready for the base plates. The 9-inch pump, with 50 feet of cast-iron column, has been hoisted from the upcast shaft, disconnected, and laid on surface. This took some considerable time, owing to the water, which was within 20 feet of the collar of the shaft, and to the fact of the timber being crushed in round the column. I have sunk and timbered the balance pit for bob 11 feet deep, 5 feet square, and hope to put in the bob stick, king post, &c., early next week.—Ross shaft. I have sunk this 11 feet during the past week, making in all 17 feet from the collar of the shaft down, the same being timbered for a distance of 15 feet. From my knowledge of this ground I have taken the precaution to put in exceptionally heavy timbers, viz., 10 inch by 12 white or post oak. These, I think, will stand all that the ground can do in the way of pressure. We have, so far, run through a number of small veins and stringers, some of which showed a small point of gold to the pan, but owing to the decomposed nature of the ground the veins have shown no regularity in either dip or strike, but run in various directions, the thickest being but 2 inches wide. I hope during the coming week to rig up my poppet head, and so be able to push ahead with the sinking of the shaft.

NEW ST. AUGUSTINE.—Extract from letter, dated April 28 from Mr. A. Bruce Brand:—There are two good and very promising features in our mine: (1) Our yield is comparatively very uniform, (2) the quality and value of our diamonds are far and away the best found in any of our South African diamond mines. The parcel now being sent to you will prove this latter, and place it beyond question. In my opinion, the St. Augustine Mine (so far as I can form an opinion at this our early stage of development) will prove to be a 15 carat mine, and when the area of our open workings is increased, say, double its present extent, we will be in a position to mine the ground at a much reduced rate and pay good dividends. The compound will be completed and in use by Saturday next. The new pan will be at work in a few days. A notification has just been received from Government that our application for the ground on the west has been favourably entertained.

PESTARENA.—Mid-monthly report:—Ends. The 55 east on No. 1 lode is carrying a lode 0·70 metre wide, mixed with a little pyrites, which is at present too little to value. In the 90 west the lode has improved, and is now valued at 4 tons of 15 dwts., the lode being 70 centimetres in width. The lode in the 140 west on No. 5 is 1·30 metres wide, carrying a small branch of ore in the centre.—Stabioli mine. Nothing of importance has been met with since reported on the 3rd inst.—Kint concession. In the Cuja adit the lode has not yet been intersected, but the rock is carrying more quartz, and continues to be mixed with pyrites. In the Cuja End West the branch is 20 centimetres wide, and although producing but little ore, has a most promising appearance. The exceeding hardness of the rock prevents much progress being made Nothing of importance has yet been found in the Oro Secco crosscut south. The winze under the Quarazza adit has been resumed to-day.—Crosscuts: Peschiera and Acquavita. The 70, 90 and 130 crosscuts continue as was reported on the 3rd inst.—Stopes. These have somewhat improved since last reported on.—Pozzone Mine. The water has now been forked to a depth of 20·90 metres; fair progress having been made since the rain ceased. There is nothing new to report on the machinery, which continues in its normal state of repair.—Pestarena, May 15. (Signed) W. Henwood Trelease, T. H. Messa.

RAND SOUTHERN.—The secretary reports that he has received the following information from the company's agent in Johannesburg:—"I have visited the Rand Southern property, accompanied by the company's engineer. The machinery is rapidly being pushed forward, and will shortly be in working order. The shaft is being unwatered, and when that is done a full investigation of the workings will be made. Sufficient examination was, however, possible to amply demonstrate the fact that the reef running through the property is the Black Reef, and the leader now exposed is identical with that being worked on the Orion."

ROBINSON DEEP.—The following is an extract from the manager's report of April 15:—No. 1 shaft has been sunk 38 feet in the fortnight, making a total depth of 728 feet from collar, set and timbered down to a depth of 709 feet from surface. The rock in this shaft has been breaking fairly well this last week. No. 2 shaft has been sunk 35 feet in the last couple of weeks, making a total depth of 773 feet from collar, set and timbered down to a depth of 765 feet from surface. The rock in this shaft has been very hard of late. We are excavating for a chamber at the 700 feet level, which is delaying a little in the sinking of the shaft. The new self-dumping skips have been started at this shaft, and are giving general satisfaction, I am glad to say. I hope to get the skips on No. 1 shaft shortly. Our new Robey engine is running very nicely at No. 2 shaft, and I feel certain we shall do good work with both engines. We have also started the small engine in the workshops. This will be a great saving in time as well as expense; also in labour, which was a heavy item.

WENTWORTH EXTENSION.—Report, dated April 13: Carrol shaft, No. 1 west crosscut, advanced 10 feet; present length, 29 feet. Without change.—East crosscut in 48 feet. Progress during week, 13 feet. Face continues in diorite, with serpentine seams. A series of trenches were made, cutting several quartz veins. Prospecing in gold.

BUFFELSDOORN ESTATE AND GOLD.—Mails advices indicate great activity preparatory to the new era of increased production, which will commence in October. Coarse screening has been introduced at the Buffelsdoorn mill, reducing the proportion of "slimes" from 20 to to 10 per cent., and returns may be expected to show 12 dwts. per ton, as against 10 dwts. in the past. A magnificent new rock-drill plant is now at work. Assays from the lowest level yet attained in the White reef go 44 dwts. per ton. A drill hole put down on the Eleazar farm has proved the reef in that portion of the property to be 63 dwts. over a thickness of 18 inches at a depth of 550 feet. Plant is to be at once established for the direct treatment of ore taken from the Black reef on the Rietfontein. The experimental treatment of ore taken from the 130 feet level on this property reduced to the size of a walnut gives a return of 17 dwts.

BROKEN HILL PROPRIETARY.—The directors report that for the week ending the 23rd inst. 8926 tons of ore were treated, yielding 701 tons of lead, containing 195,854 ounces silver; also 1894 tons treated by amalgamating and leaching plants producing 29,773 ounces silver. The price of the shares in Melbourne is £2 5s. buyers. Usual dividend of 1s. per share declared payable June 19, the books for which will be made up on the morning of the 5th of that month.

MALLINA CONSOLS.—The directors have received the following cable from the mining manager:—"Roebourne. Underlay shaft 50 feet; reef 20 feet wide. The deeper down the richer the ore. Vertical shaft 20 feet deep. Have driven in 20 feet east and west; 200 tons ready stope."

LOWER ROODEPOORT.—The following has been received from the manager at the mines:—"The work of development at the mine is proceeding satisfactorily. Have struck three good leaders, and by next mail I will send you a full report, with my advice as to the best means of obtaining speedy returns. I am sending you samples of quartz taken from the northern reef, which I think you will find will turn out well."

STRAITS DEVELOPMENT COMPANY (LIMITED).—An extraordinary general meeting of the shareholders in this company was held on Thursday, at Cannon-street Hotel, under the presidency of Mr. Berdoe-Wilkinson, for the purpose of hearing from that gentleman an account of the recent discoveries made in their property of Pasoh. Pasoh, he said, was a property 100 square miles in extent, accessible from the Ports of Malacca and Dickson. Near the Challong creek were found the first signs of a reef. There was an immense body of ore here, and it was not an extravagant estimate to presume that it would yield half an ounce of gold to the ton. All the geological appearances went to confirm that estimate, which, if correct, would pay handsomely. Promising indications were found on the Pasoh creek of the existence of a reef, and two other reefs had been found on the Cherabung creek. One of the reefs there gave only a little gold and silver, so far as present appearances went; but the other reef yielded 2½ ounces of gold to the ton. The reef was situated on virgin soil, no white man ever having been there before, and was cut 10 feet beneath the surface, and laid open for 45 feet continuing with the hill on one side and outcropping on the far side of the small gully on the other. The gold existed in the stone—which had a decomposed appearance, and resembled very much the ore of the Mount Morgan property—in particles of the size of a pin's head, and as soon as the stone was broken the gold fell out. He, himself, had ordered the stone to be taken indiscriminately from the reef, and in every case it had yielded gold. The best feature about the reef was the fact that its walls were well defined, thus indicating that the reef would not prove inconstant either in length or depth. In that reef alone they had a very valuable property, regarding the sale of which negotiations were already opened up, and which gave every promise of yielding cent. per cent. to the shareholders if sold, still leaving them 15-16 of the Pasoh property. The Chairman concluded by emphatically contradicting the rumour that there was a flaw in their lease.—A vote of thanks to Mr. Wilkinson concluded the proceedings.

ROYAL OAK OF HAURAKI.—"This mine has just been floated on the London market, and includes the Great Tokatea and Tokatea Extended, and is likely to be a very valuable property," says a correspondent of the *New Zealand Herald*. "A very large amount of gold has been won from these mines, and yet the deeper workings have been almost untouched. I think if this mine is taken in hand vigorously and systematically worked, it will pay handsomely. The main reef strikes right through this mine, and it should receive much more attention than it has ever done yet, and there are many leaders and stringers which have not been worked to any great extent."

ALMADA AND TIRITO.—Report for month ending April 27: Dios Padre. The lode in the 250 feet level driving north is small and poor, composed chiefly of small veins of quartz through the porphyry. 17·6 feet were driven by three men.—Guadalupe. The lode in the tunnel driving south of Ibarras cutting is well defined, and yields occasional stones of green ore. This was extended 30·1 feet by six men, the total length being 100 feet. No. 1 shaft is now 53·9 feet deep, 27·9 feet having been sunk during the month by nine men. The rock is very hard, brown porphyry, with small stringers of lime running through it in all directions. At No. 2 shaft we suspended the clearing of it at 75·7 feet deep, where a large influx of water was met with. The men are removing with all speed a whim from the Dios Padre shaft, which in all probability will be fixed and in working order at the No. 2 shaft by the end of this week.—Stopes. During the first three weeks of the month our production from the stopes fell off considerably, but they have now a better appearance.—(Signed) John Nute.

ANGLO-MEXICAN.—The manager, writing from the San José de Gracia mine, under date April 10 says:—New main tunnel. This tunnel was advanced 17 feet during the past week, having now attained a total length of 1454 feet. From this you will note that very satisfactory progress continues to be made in this work.—Face of Guadalupe. Work on this tunnel was pushed ahead steadily during the past week, having been advanced 11 feet, and making a total length to date of 2453 feet.—Drift south from air winze. This drift was advanced 17 feet during the week under review, making a total length to date of 124 feet. The vein in this drift continues to look about the same as last week, carrying ore assaying about $20 per ton in gold.—Drift north from air winze. Work on this drift was advanced 9 feet during the week under report, making a total length driven to date of 48 feet. The vein in the face of this drift looks about the same as it has done for the past two weeks, carrying ore assaying about $30 per ton.—Upraise No. 14 from drift south from air winze. This upraise was advanced 5 feet during the past week, having attained a total height of 27 feet above the south drift. The ore in this upraise is not of as high-grade as it was last week, but it still continues of a good milling value.—Upraise No. 11 No. 1 level. Work on this upraise was advanced 12 feet during the past week, having now reached a total of 131 feet. The vein in the face of the upraise has improved in value since my previous report, and now carries ore assaying about $50 per ton.

AUSTRALIAN BROKEN HILL CONSOLS.—The mining manager reports by mail for the fortnight ended April 11;—Block 96. 280 level, west prospecting drive.—No. 4 rise. Stopes ditto.—No. 6 rise. Driven 28 feet. Stoping continued. In the eastern drive the lode consists of iron and quartz, and we are now following the same downwards. In the south-west the lode is being followed under the level; it is 3—4 inches wide, consisting of carbonate of iron and quartz, the mundic being strong. On account of the inflow of water and hard ground, progress is rather retarded. The lode in No. 6 rise to eastward not looking so well; we are now stoping westward towards No. 4 rise.—280 level west off air-winch stopes, driven 4 feet. Work here has been suspended. Men are about to be removed into the prospecting drive west to continue driving.—Incline No. 5. East off driven 12 feet; total, 133 feet. The lode here is looking more promising. Galena and fahlerz has been met with in carbonate of iron.=No. 4 level, Underhand stopes driven 10 feet. The lode here is narrowing and getting more settled. Raised some galena and fahlerz, the latter being more compact. Note.—The quantity of rock mined during the fortnight was 2064 cubic feet.

BRITISH BROKEN HILL PROPRIETARY.—Mining manager's report for the week ending April 10: Blackwood (No. 1) shaft, 240 feet level. East crosscut lengthened 12 feet, total length 20 feet, face showing country rock.—Howell (No. 2) shaft, 300 feet level. West crosscut extended 5½ feet, making total length 65½ feet. Face in extremely hard mineralised rock. North east drive advanced 16 feet, total length 179 feet. Face in country, through which water is now making. East crosscut extended 5 feet, total distance 28 feet. Face in hard mineralised country.—200 feet level. Have finished fixing ore shoot in bottom of Far North winze, and will also complete the division in same to-day.—100 feet level. Have started an uprise in Far North stopes, in which we are putting square sets, and good progress is being made, rise showing good lead ore.—Marsh (No. 6) shaft. Second level. Have been fossicking on lode northwards from west crosscut down winze stopes, but ore has pinched out somewhat, and appears as if sulphides are taking its place; will continue for awhile, to prove same. We broke 4 tons, assaying 21 per cent. lead and 60 ounces, and 9 tons average 16 per cent. lead and 40 ounces of silver per ton. South-west drive near junction boundary was driven 9 feet; total length, 118 feet; face encountered mullock, and work was consequently suspended.—No. 2 west crosscut off north drive lengthened 13 feet; total, 44.—No. 2 east crosscut advanced another 11 feet off north drive, making total length 37 feet, both crosscuts showing country.—Retallick's workings. Last Tuesday tributing operations were commenced down winze in north drive from Retallick's winze, where some fair grade carbonate ore is exposed. The assays for the week vary—carbonate ore from 11 per cent. to 59 per cent. lead, and from 3·9 to 69·2 ounces silver per ton; sulphides from 10 per cent. to 27·5 per cent. lead, and from 3·9 ounces to 12·4 ounces silver, and from 7·8 per cent. to 21·7 per cent. zinc per ton.

BIG BLOW.—The following is an extract from a letter received from the company's engineer at Coolgardie, dated April 16:—"The mill site is a splendid one, and with the tramway arrangement I am sure you will have one of the best equipped mines in Western Australia, and, I have no doubt about the mine being a good one, and I feel flattered to be one of its officers in its youth. I feel sure it will prove itself when it once gets running. Everything is in excellent shape, and enough quartz in sight to last for years."

CHIAPAS.—Mine report for fortnight ending April 15: Providencia Aver driven 9 feet, total 247 feet. Following streak carrying pyrites. Assays, 6 dwts. gold, 2 ounces 14 dwts. silver, 0·7 per cent. copper. Taylor main extension driven 7 feet, total 622 feet. Assays, ½ dwt. gold, 1 ounce 5 dwts. silver; somewhat softer. Santa Fé Hill No. 3 driven 6 feet, total 59 feet; no change. Taylor Copper creek driven 16 feet, total 196 feet; continued a few feet further after stopping in order to cut under and across river bed above. Sylva crosscut No. 2 driven 4 feet, total 112 feet; no change. Sylva crosscut No. 3 driven 6 feet, total 25 feet; has shown a few colours of ore. Pine creek No. 2 driven 15 feet, total 49 feet; still in dyke rock. Pine creek No. 3 driven 10 feet, total 46 feet; no change. Providencia Aver rise No. 1 risen 7 feet, total 30 feet; about 2 feet of ore in back.—Extracted. Old Providencia, 347 tons stoped. Assays 14 dwts. 12 grains gold. 6 ounces 19 dwts. 1 grain silver, and 3·09 per cent of copper. Santa Fé Hill, 40 tons stoped, good ore, but no assay made. Santa Fé stopes, 300 tons stoped; assays 9 dwts. gold, 6 ounces 6 dwts. silver, and 3·93 per cent. copper in the east stopes, and 6 dwts. gold, 9 ounces silver, and 3·45 per cent. copper in the west stopes. Taylor No. 3, 17 tons stoped; assays 19 dwts. gold, 8 ounces 19 dwts. silver, and 4·92 per cent. copper. Providencia rise No. 1, 29 tons stoped.

CARRINGTON.—Mr. Alan B. Bright the manager, writes under date April 6: I have called tenders for sinking the shaft a further 100 feet, or to the reef or formation. Miners will offer to sink at less per foot for 100 than for 50 feet. Mr. Bray, the mine manager, has had a miner trending the surface in order to discover the cap of a reef. Some nice little leaders have been discovered showing gold, but not the proper cap. The *Queenslander* of April 13th, says that 53½ tons of stone from the footwall reef of the Victoria, for which we are now sinking, yielded 326 ounces of gold, or over 6 ounces to the ton. This is the second crushing, and is very encouraging for the Carrington.

COLON GOLD.—The secretary reports that he has received advices from Mr. Russell, dated 3rd April, in which he states that "the revolution is, to all appearances at an end, and from the latest news received I am in hopes that we shall have no further trouble for the present." Mr. Russell states that, if necessary, he will go to Bogota to get the resolution required, and he gives details of the present state of litigation, which the directors consider should not be published *pendente lite*.

EASTLEIGH MINES.—Excerpt from letter received from the head office of the Eastleigh Mines (Limited), dated Pretoria, April 19:—Manager's monthly report. The manager's March report continues favourable all round, our prospects being, as heretofore, very promising. The new main vertical shaft is expected to strike the reef in about five to six weeks' time. The manager feels confident that the results will be all that is expected. At the main incline the latest assays at the 600 feet level continue very good, and we are in better ore all round in this district.—No. 2 east and No. 1 west shafts. Developments are being pushed on with all possible speed; the former shaft is not yet fairly in the pyritic body, while the latter carries a reef 6 feet wide, assaying 14 dwts.—Eastern district. 1500 tons from this part were milled last month, running 14½ dwts. We have every reason to expect that the output will be fully maintained and improved as we go along.

ELKHORN.—Copy of Mr. C. A. Molson's monthly report for April:—Mine. Ore breaking department. 550 feet level south. The vein is 30 inches wide, and the value is 52 ounces. This ore is sent direct to the mill.—650 feet level south, porphyry stope. The vein is 2 feet wide, and the value 35 ounces. The back of the stope has been worked out.—750 feet level south, under No. 2 stope. The vein is 3 feet wide, and the value 34 ounces.—North of the shaft. The vein is 15 inches wide, and the value 46 ounces.—North of the shaft. The vein is 15 inches wide, and the value 46 ounces.—850 feet level north. The vein is 2 feet wide, and the value 43 ounces.—950 feet level north. The vein is 8 feet wide, and the value 40 ounces.—Raise stope, south end. The vein is 1 foot wide, and the value 48 ounces. Connection was made between the raise and stope in the early part of the month.—1050 feet level south, north end of main stope. The vein is 18 inches wide, and the value 38 ounces. North of the shaft. The vein is 3 feet wide, and the value 30 ounces.—1150 feet level north, raise stope. The vein is 15 inches wide, and the value 36 ounces. Some bunches of high-grade smelting ore are found at the north end of ground. South of the shaft, south end of stope. The vein is 2 feet 6 inches wide, and the value 29 ounces.—1250 feet level north, underhand stope. The vein is 3 feet wide, and the value 28 ounces.—1350 feet level south raise stope, north end. The vein is 18 inches wide, and the value 60 ounces. Main stope, south end. The vein is 18 feet wide, and the value 36 ounces. The ore is all of the dry milling class, no shipping ore having been found here lately.—1450 feet level north. The vein at the end of the raise is bunchy and irregular in size. Its average value is 80 ounces. South of the shaft, back stope, north end. The vein is 18 inches wide, and the value 75 ounces and 8 per cent. lead. Centre stope. The vein is 2 feet wide, and the value 30 ounces. A small amount of sulphide shipping ore has been obtained here.—1550 feet level south. This block of ground is worked out at the north end, the stope having reached the level above. Dry ore is standing in the inside raise.—1650 feet level south, outside stope. The vein is 2 feet wide, and the value 35 ounces. Some sulphide for shipment is found here.—Inside stope. An underhand stope is being started below the inside raise. The ore is 18 inches wide, and assays 85 ounces.—1750 feet level south. Some stoping has been done at a point 194 feet from the shaft. The ore is irregular in occurrence; its value is 46 ounces.—Prospecting department. 1750 feet level south. Previously reported, 813·8 feet; advanced in April, 131·3 feet; total length, May 1st, 945·1 feet. No ore was developed by the extension of the drift. The soft ground in which the inside chute occurs on the 1650 feet level was met with in its expected position, but there was nothing of value in it.—Raise to 1650 feet level. Previously reported, 89 feet; advanced in April, 100·7 feet; total length, May 1, 189·7 feet. The raising during the month was all in barren ground, the chute of ore not extending to the level above. (At the date of writing the raise has holed to the 1650 feet level, the total length 216 feet.) Arrangements to resume sinking are now being made, the tank at the station being completed, and the timbering for the baby hoist ready for the engine. In the meantime, work has been started on the north side of the shaft, and the prospect drift will be run in to explore this section.—Amount and source of ore hoisted:—Level: 550, 93 cars; 650, 29 cars; 750, 67 cars; 850, 56 cars; 950, 237 cars; 1050, 114 cars; 1150, 129 cars; 1250, 75 cars; 1350, 499 cars; 1450, 251 cars; 1550, 33 cars; 1650, 143 cars; 1750, 12 cars; total cars hoisted, 1738. Number of tons, 1041.—Milling department. The pans ran steadily all the month. A new cam-shaft was placed in the No. 1 and 2 batteries. The machinery is all running well.—Table of work performed. Ore on hand April 1st, 126·34 tons; raised from the mine, 1041 tons; less smelting ore, 37·95 tons; waste, 119 tons, 156·95 tons, 884·05 tons; add for salt, 142·83 tons; dry ore panned, 1037·67 tons; pulp in the mill, 31·55 tons; rough ore in stock, 84 tons; total, 1153·22 tons, 1153·22 tons.

GRAVEL GOLD MINES OF COLOMBIA.—Advices from the superintendent, dated March 21, state that the last clean-up gave a profit of £330. Washing is now being carried on continuously day and night; the gravel banks look very well, and no trouble whatever is being experienced with the ditch or syphons. The revolution is now entirely suppressed, and no further interruption to the communications is expected.

HARMONY GOLD AND LAND.—The manager writes under date the 20th April from Johannesburg:—"I hear some splendid reports about our part of the country; all the big houses here having substantial interest there. It is also current talk that Sutherland Reef is a very fine and payable property."

HARQUAHALA.—Copy of Mr. Robert M. Raymond's report for the month of April: Mining department. Bonanza group. Ore breaking. Iron vein, 1st level. 170 tons of ore were broken from ground adjoining the winze and just below the level. A small bunch of ore lies here, but does not extend far in depth. The ground at the east end of the old workings on the iron vein has been stoped out.—Discovery vein, big stope. 130 tons of ore were drawn from the pillars. This is all that is accessible from this point until these stopes are further filled, which is being rapidly done.—Prospecting. East contract, 4th level. This has been advanced 72 feet, a total of 319 feet. Two crosscuts have also been driven from this to the contact, one of 17 feet and another of 50 feet. Occasional traces of gold were found, but nothing of value or very promising has been encountered. A raise was made 30 feet at one of the most favourable points, but did not improve in the upper part.—Contact west. Drift from foot of porphyry stope. This has been advanced 32 feet, a total of 252 feet. A crosscut 100 feet in length has also been driven. The ground explored has been mainly over the 7th level in the ore-bearing schists and along the contact. The ground has proved less hopeful towards the west, and work has been suspended at this point. The raise at 110 feet along the drift encountered a layer of ground almost flat, that had been prospected by a drift running north-west. The indications have improved, and narrow streaks with a little gold have been encountered, that give new hopes of finding something above.—West contact, No. 1 stope. A drift has been run from this to the ground last mentioned, but nothing of value has been found between. The connection gives better air for the intended raise. Surface work. Prospecting on the surface has been carried on in a few places. A limited amount of low grade ore can be obtained near the apex of the Discovery vein. Investigation of the surface of the Porphyry has been made, but nothing of value found on the claims. Occasional spots are found in this, but of very small extent.—Golden Eagle group. Ore breaking. No. 2 winze, south. 210 tons of ore were broken from this ore body, averaging $8 and $9 per ton, which completes this, the stopes having been carried up to the tunnel level.—Prospecting. No. 1 winze, south. A sump 7 feet deep was cut, making the shaft 207 feet in depth. From this a crosscut has been run 33 feet to cut the contact. The lower part of the shaft was sunk in porphyry which has evidently flattened out somewhat. We expect to encounter the contact within a few feet.—No. 1 winze north. A winze was sunk on the ore body in the north drift. The ore continued down for 15 feet when it pinched out, and on continuing the winze down to a depth of 45 feet nothing further was found. A crosscut was run out into the hanging wall at 20 feet, and another is being run out from the bottom. The prospects are not encouraging for ore coming in again.—Milling department. Forty stamps were run for 6 days, and 20 stamps for 6 days longer. Since then the mill has been hung up, and will remain so until the last of this month, when ore will be obtained from the pillars and roof of the Discovery vein. The estimated yield for the short run is $4200 from 745 tons of ore. The expenses for the month are as follow:—Ore breaking, $2450; prospecting, $6100; milling, $1400; taxing legal expenses, insurance, $783; tailings plant, $4000, total, $14,733.—Tailings plant. The masonry for the foundation of ore-vats, ore-bin, and engine is completed. The timber foundations or supports for the vats are nearly all up, and two vats are in place. The erection of the plant is going forward as rapidly as the material can be got in.—Diamond drill. A hole has been bored from the 7th level, 125 feet deep, encountering at that depth a little slate and iron oxide. This hole caved badly and after several attempts to get it clear was abandoned. Another has been sunk at another point, and has reached a depth of 75 feet in hard porphyry. This will be sent down as far as possible.

LIONSDALE ESTATES.—The following has been received from our manager at Lionsdale, dated April 12: Deep levels adit. I am glad to be able to report that the reef is now rapidly increasing in size; it is already over a foot thick.—Higher level. This level has struck a reef a foot thick, but not the Lion reef yet. As I believe this reef has not yet been named, I would suggest the name of the Lion reef leader, as it is dipping the opposite way to the Lion reef, and towards it. There must be a junction of the two, and this higher level will cut this junction.—Mill. The work here is being rapidly pushed on, and the ore bin is almost complete, and the dynamo is fixed in position.

NORTH COOLGARDIE.—The directors have received the following reports from Captain Odgers, April 6:—The main shaft has been sunk and timbered for the week 12 feet 6 inches, making the distance from brace 57 feet 6 inches. The west drive has been driven 14 feet, total distance from underlie shaft 71 feet, the lode is just the same as when last reported. The drive east has been driven 9 feet, total distance from shaft 65 feet. The lode is 3 feet wide of quartz.—Lease 1164. Prospect shaft No. 1 has been sunk to the depth of 60 feet. A vein of ironstone has been struck near bottom of shaft; at present it is very small with some of the stones showing a little fine gold. Prospect shaft No. 2 has been sunk 16 feet, making it 42 feet from brace.—April 13: The main shaft has been sunk during the week 12 feet 6 inches, making total depth from brace 70 feet. The ground in this shaft has got much harder; we are sinking now in the diorite rock. The drive west has been driven 16 feet, total distance from underlie shaft 87 feet. The lode in this drive is 5 feet wide, and is looking very well. The east drive has been driven 8 feet, or total distance from shaft 73 feet. Lode is 2 feet wide of quartz. Lease 1164. There has been some 15 feet driven from bottom of No. 1 Prospect shaft, and we find the reef to be about 1 foot 3 inches wide mixed with sandstone and iron. Work will be suspended in this place for the present.—No. 2 Prospect shaft. In this shaft 16 feet has been sunk during the week, making distance from surface 58 feet.

QUEEN CROSS REEF.—Manager's report for fortnight ending April 2: Since my last report, according to instructions, I took the men out of the No. 1 crosscut and started to timber, and we have timbered up about 46 feet and finished, and then commenced to rebatten the shaft in the crosscut in No. 1 level north. We started to go down to meet the reef at the nearest point, and we are now about 8 feet below the level of the crosscut, and there are still nice floors coming in, but there is no sign of the reef yet.

QUEEN'S BIRTHDAY UNITED.—The following mail advice has been received from Mr. W. Barton, the company's mine manager, at Dunolly, dated April 8: Queen's Birthday Mine. Since your last meeting the various works at the mine have been carried on continuous by No. 1 shaft; water now down 18 feet below No. 5 level. No. 2 shaft cut through to the surface; this work has been completed in a very satisfactory manner.—No. 4 shaft. Have taken two crushings out of this one from the large load, and one from the wall, but neither one proved payable. The eastern drive is in very nice country, and a good drop of water coming from face. The tributers north are raising stone for crushing.

ROTHERY BLOCK.—Extract from managing director's report, dated April 29: I visited the property on Saturday last, and found good progress had been made with starting the works. The prospector's house is nearly completed, and the Kaffir compound will be ready by the end of this week. Trenching has been pushed on at right angles with the formation, and it is my intention, after consulting Mr. Pedersen, to continue this work right across the property so as to cut the many reefs we have on the block and test their value before starting to sink a shaft. On Friday, in trenching, we found a reef about 3 feet from surface with very good indications, and I think we shall find the leader a little way east of this reef. There is no doubt it approximates the Randfontein Main reef as near as can be, and if it should prove so, then we shall find the leader slightly to the east.

TRANSVAAL GOLD EXPLORATION AND LAND.—Extract from manager's advices, dated April 26. Mining. Stripping the overburden at Theta was being continued. The transport of ore from Iota was commenced; this ore will be treated direct by cyanide process. Work at the other mines was proceeding as usual, with no new feature to report. General. The supply of native labour was fairly plentiful. The rainy season had not entirely passed away, and wagon transport during the week was somewhat interfered with.

UNITED GOLD FIELDS OF MANICA (Rezende Mine).—Return of mining work done during the two weeks ending April 6:—Work. Adit No. 3 west drift driven during the two weeks 52 feet. Total length 269 feet. Dimensions of work 6 feet by 4 feet. Timber put in, length 192 feet, diameter 6 inches. Two white men and 12 natives employed in decomposed schist, working day and night. 15 natives cutting and carrying timber to supply both shifts. Crosscut to north from end of drift driven during the two weeks 3 feet. Total length 36 feet. Dimensions of work 6 feet by 4 feet. Just started in search of reef. Total driven during the two weeks 58 feet. Total timber put in 192 feet. Two white men and 27 natives employed.—(Signed) C. J. Alford and Co. (Signed) per H. Lionel Sargent, consulting engineers.

VICTORIA AND QUEEN.—Manager's report for the fortnight ending April 3: About 50 tons of stone on surface for crushing. Broke through to the Victoria and Caledonia block 25 feet below the 512 feet plat. We have been up to the winze 26 feet and, stripped it down to the drive; reef is 5 feet west of the shaft, with about 1 foot thick of fair mineral stone. We have also struck the reef in the 442 feet crosscut, which is about 1 foot thick, of heavy mineral stone. Machinery and everything in connection with the mine is in good working order.

APPANTOO GOLD MINING COMPANY (LIMITED).—An extraordinary general meeting of this company was held at Winchester House on Tuesday, for the purpose of considering and, if deemed advisable, approving the terms of a contract signed between the company of the one part and Emilio Zuccani of the other part, for the sale and purchase of one-half of the company's property known as the Broomarsie concession.—Mr. A. G. Kitching, J.P., who presided, said that he had never taken the chair with so much pleasure as he did that day, because they had never been in so satisfactory a position as they were at the present moment. As they were aware, they had 4½ miles on the reefs, and the portion which they had agreed to sell to M. Zuccani was the eastern portion of the Broomarsie claim—about 3000 feet in all; so that, in spite of that sale, the company would still be left with enough property to form a good many mines. The purchaser was to form a company with a capital of £90,000, and to pay to the company for the property so acquired £5000 in cash and £25,000 in shares. The purchasers had the option of taking over the other half of the Broomarsie claim within a period of 18 months on the payment of £35,000 in shares of a new company to be formed with a capital not exceeding £90,000. He concluded by moving a resolution approving of the action of the directors in entering into the contract for the sale of the property mentioned.—Mr. Williams seconded the motion, which was carried unanimously.

MECHANICAL ENGINEERING:

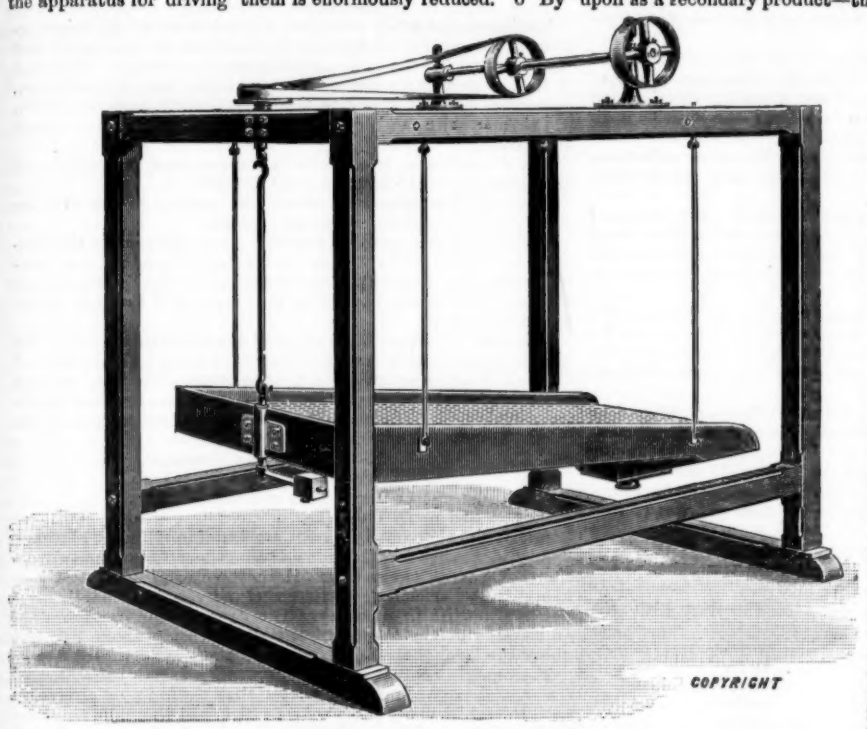
MACHINERY, MINING and RAILWAY PLANT, &c.

Illustrated Descriptions of New and Standard Mechanical Appliances, Accessories and Processes, adapted to Mining, Metallurgical, Railway, Engineering and other Industrial Purposes.

THE VIBROMOTOR.

A MECHANICAL appliance which is gaining ground in the favour of engineers, and of which we are enabled to furnish our readers with an illustration, is the "Vibromotor," whose purpose is to utilise the vibrations and oscillations which are not only harmful to machinery, but which occasion a considerable waste of energy.

The Hardy Patent Pick Company, of Sheffield, who are the originators and patentees of the invention, claim for it a number of advantages, which may be briefly enumerated:—1. The mechanical power hitherto wasted in producing the harmful vibration is utilised, thus decreasing the power required and increasing output for a given power. 2. By which the power required is reduced at least 50 per cent. 3. By which all the trouble and cost of balancing are rendered completely unnecessary. 4. By which cranks and their bearings are dispensed with. 5. By which the cost of construction of machines and the apparatus for driving them is enormously reduced. 6 By



which the cost of erection of machinery is also largely reduced. 7. By which machines now rendered unusable by the vibration they cause in mills and other buildings may be worked. 8. By which the vibration of the floors and walls of mills and buildings can be stopped. 9. By which the output of many kinds of machines may be increased from 20 to 100 per cent. 10. By which many machines in which oscillating, shaking, reciprocating, or gyrating movements are required can be worked at from two to five times the speeds hitherto possible.

Summing up the general utility of the machine they say:—'No invention has been brought out for many years which, while being a new mechanical motion, has been applicable to so many purposes. It is, at once, the means of avoiding one of the greatest and most universal causes of trouble to mechanical engineers and users of machinery—namely, the difficulties which attend the perfect balance of machinery and the avoidance of vibration and consequent wear, tear, and waste of power, and cause of litigation."

A NEW EXPLOSIVE.—The "Life-safe," a new explosive discovered by Mr. Fahey, was recently tested in Ballarat. The inventor claims that it can be handled by a child, and that its power when brought into operation for blasting is enormous, and in excess of any other. It is a yellow substance, resembling sawdust in appearance, and can be manufactured cheaply. Ignited in its loose state it burns like sawdust, and the concussion of a hammer has no more effect on it than on common road dust. There is, it is stated, not the slightest fear of explosion in tamping, and there is a minimum of smoke, smell, and noise when the explosion does take place. The inventor further claims for it twice the power of dynamite, whilst its cost is only a fraction greater than that of blasting powder. The explosive was subjected to two practical tests—one in the Britannia Mine and the other in the local quarries. At the mine two shots, one wet and one dry, were fired. The dry shot put in, containing 2½ ounces of the explosive, at a cost of 1½d., did the work of an ordinary shot in the face. The wet shot also contained 2½ ounces of the explosive, at a cost of 1½d. The boss of the shift said that it did work that could not have been done by three times the usual explosive, and it was declared that no fumes were observable. At the quarry two shots at a cost of 2d. each were put to the test, and the results, the quarrymen said, were highly satisfactory.—*Australian Mining Standard.*

THE West Gas Improvement Company, of Miles Platting, Manchester, are constructing for the South African gold fields, two large air compressors, of their two-stage with intermediate cooler type, a few details of which may be interesting. One of these compressors is to supply compressed air at 100 lbs. pressure, for driving ten rock-drills, and one for driving 20 rock-drills at the same pressure. The steam-engines will be compound, with valve gear of the Sulzer type, and the whole of the suction and delivery valves of the air-compressor will be controlled by cams, arranged under West's and Jenkins' patents. Owing to the high price of fuel in the district about Johannesburg, which is the destination of these compressors, they are to be of the most economical type, with surface condensers, and the steam cylinders will be jacketed all over, besides being carefully lagged, so that as little radiation as possible takes place. The firm has guaranteed that the compressors, when completed, will deliver 93 per cent. of the volume swept through by the piston, which represents a high efficiency, and the power required for compressing the air is greatly economised by means of the intermediate cooler, which will abstract a large portion of the heat developed in the low-pressure air cylinder. We may add that compressors previously made by the West Company have been tested by Professor Goodman, of Yorkshire College, who testifies to the exceptionally high efficiency obtained.

AUSTRALASIAN VIEWS ON THE ORIGIN OF GOLD NUGGETS.

By FREDERICK DANVERS POWER, F.G.S.

IN the following notes on the origin of nuggets, I have purposely ignored, as far as possible, the investigations and opinions of workers in other parts of the world, not by any means with the intention of disparaging their labours, which in many cases have led them to the same conclusions as their contemporaries in this quarter of the globe, but because the object of this paper is to give an epitome of experiments and observations made in the Australasian colonies, where full scope has been given, by competent men, to investigations both on the field and in the laboratory. These results are dispersed through various Government Reports and Transactions of Australasian scientific societies, which are not always accessible to students of ore deposits in the northern hemisphere.

There are two rival theories to be considered, which purport to account for the formation of nuggets, viz.—First, the mechanical; and, second, the chemical.

The Mechanical Theory.

This was the first theory put forward to account for the presence of gold nuggets and grains found in alluvial deposits, and from its nature there is no occasion to search for a solvent or precipitant, but only for the source of the gold. Being looked upon as a secondary product—the débris of pre-existing deposits—it is not necessary to go further back in our search than the lode or lodes from which the gold is supposed to have been shed. Assuming, as this theory necessarily does, that gold forming a nugget was originally aggregated in some form of lode, that lode and its surroundings may have been entirely disintegrated so as to leave no trace behind, or the lower portion may still be intact to guide us in our search, though, perhaps, temporarily hidden under an accumulation of débris.

The first reason that leads one to suppose alluvial gold to be detrital, is because it is associated with other detrital material which, when *in situ*, is found to accompany reef gold. The quartz and other veinstones found in alluvial deposits remain as witnesses on account of their hardness; but gold, though soft, remains chiefly on account of malleability, weight, and insolubility in ordinary solvents, or, in other words, because it is more stable chemically and physically than other minerals that have been carried away, *i.e.*, its environments are suited to its existence. Being malleable and not brittle, it is cut into and smoothed-down by harder material, rather than ground-up, while on account of its weight it is more difficult to carry forward by a current of water sufficient to move lighter particles of the same size easily; a natural classification thus tends to take place, according to weight. The under-current of water loosening the gravel on the bed of a river gives the gold an opportunity to work its way down through the interstices between the pebbles to the bottom, where it is protected by the gravel above from further disintegration.

The rounded and mammillated structure of alluvial gold is not due to its being water-worn by rolling over like the lighter quartz pebbles, but is due rather to the pebbles and shingle rubbing up against the gold.

Now since the position of a gold nugget is not strictly analagous to that of a coarse particle of reef gold, which is cut up and pounded in a battery with myriads of pieces of sharp angular quartz, we can quite understand that a large lump of reef gold is likely to remain in one piece, should it find its way into an alluvial deposit, unless some portion, connected to the main body by slender bonds, becomes detached as a subsidiary nugget.

For some time it was contended that masses of gold did not occur in reefs of a size sufficiently large to make a big nugget, and that if they did they were of such rare occurrence that they could hardly account for the proportion of nuggets that are found in alluvial deposits; besides, by being worn down by constant friction, they would tend to decrease rather than increase in size.

As far as the first objection is concerned there are many specimen mines that have yielded large masses of gold; one historical block mined at Dr. Kerr's station in New South Wales, weighed 75 lbs. gross, and yielded 60 lbs. of pure gold. Near St. Armand, in Victoria, a mass of gold was found in a quartz vein weighing 500 ounces, together with other smaller pieces, weighing in the aggregate nearly 400 ounces.* As to the second objection, we must not forget that alluvial deposits are the débris of unknown ages, and are the products of thousands of tons of ore, which, being an unknown quantity, prevents us from making comparisons in the way of proportions. Then again, as a rule, coarse gold is more prolific in the upper portions of a vein than in the lower parts, so that the caps of existing reefs, that have already been denuded, may have yielded up larger lumps of gold than now remain behind in the reef; anyhow, it is quite fair to argue from analogy, that if large lumps of gold ore found nowadays in reefs, large lumps also existed in reefs at present denuded; and, if this is correct, then where are they now if not in the alluvial deposits? The third objection has already been answered—gold, not being of a brittle nature, is not easily broken up by the harder but smooth stones accompanying it. Besides, the argument does not sound well when put forward by the upholders of the chemical theory, to be mentioned later on, which supposes the segregation of gold to have taken place, this being entirely opposed to the diminution of nuggets in size, unless they further claim that the increase was greater than the mechanical decrease. Nuggets at times have the appearance of several pieces of gold, as it were, welded together; the conditions favourable for such a coalescence of loose grains can but seldom occur. It appears to me that the phenomenon is due rather to the beating-down of excrescences and branches of the original rough gold, in which case the supposed added pieces belong to the main lump, and are held in position favourable for welding by connecting wires and sheets.

Most nuggets are found near the reefs from which they are supposed to have been shed, and when this is not the case there is no satisfactory proof that a nearer reef has not been overlooked, or that a pre existing one has not been completely worn away. Mr. T. Couchman, a mining surveyor of Victoria, states that in auriferous leads it almost always follows that nuggets of the largest size, and showing the greatest differences in form and weight, are found deposited in the tributaries, or near the supposed sources of supply; and as the leads die out for want of feeders, the gold becomes very fine and devoid of nuggets of even the ordinary size, as appears to be the case in the leads at Pleasant Creek. This he considers an argument against the formation of nuggets by chemical means *in situ*, as the small grains near the termination of the leads must have been equally subject to the action of meteoric waters.

Then, again, nuggets do not always occur on the bedrock, where, at first sight, on account of their superior specific gravity, one might expect to find them. If, owing to the loosening of the gravel by an undercurrent, a nugget once found its way to the bedrock, we would hardly expect the nugget to reappear on the surface, as it would not be under favourable conditions for working upwards by earth movements, or with the assistance of burrowing animals, as stones in our fields so frequently are. The fact of being found on or near the surface is another argument in favour of the mechanical origin of nuggets, for though heavy, the lump of gold, in spite of this, may progress forward in course of time, especially when on an incline, if pushed by water or falling rocks, hit against or undermined by animals, or disturbed by earth movements due to various causes.

The largest nugget ever found—the "Welcome Stranger"—which was discovered on February 5, 1869, weighed more than 2280½ ounces, and was found on the extreme margin of a patch of alluvium trending from Bull-dog reef. It was lying in loose gravelly loam, resting on stiff red clay, within two feet of the sandstone bed rock, and was scarcely covered with earth. The Dascomb nugget, found at Bendigo in 1852, weighed 332 ounces, and was lying only one foot below the surface. A nugget found at Mount Korong, Victoria, in 1856, weighed 255 ounces 13 dwt, and was also but one foot below the surface. At Kingower, Victoria, in 1880, a nugget weighing 230 ounces was found on the surface, and in 1861 one weighing 236 ounces was found only half an inch below the surface, in the same locality. At Mount Blackwood, Victoria, in 1855, a nugget weighing 240 ounces 18 dwts. was picked up on the surface, and at Meroo Creek, a tributary of Turon river, N.S.W., one was found in 1851, which weighed 1272 ounces, right on the surface. From these, and several other instances, we see that it is not necessary for a large nugget to rest on the bed-rock, or to have been long associated with alluvial deposits.

There seems to be a general impression that coarse gold is of inferior quality to smaller particles; but this is not always born out by fact. The "Welcome Stranger," already referred to, was ·992 fine, and other cases may be seen in "A Tabular Record of Gold Nuggets," by William Birkenyre, reprinted in R. Brough Smyth's "Gold Fields and Mineral Districts of Victoria." The above examples, selected from our largest Victorian nuggets, tend to upset the theory that small particles of alluvial gold are finer in quality than large lumps, on account of them offering a greater surface, in proportion to their bulk, for the action of oxidising and solvent agents, which are supposed to abstract the baser metals alloyed with them. Moreover, Mr. Geo. Foord, late assayer at the Melbourne Mint, informs me that he has been unable to distinguish any difference in the fineness of the outside of a nugget and that of its interior.

When we come to consider how difficult it is to part gold, unless alloyed with a fair percentage of silver, we can quite understand that it would be difficult for Nature to refine a nugget of average quality with the dilute solutions at her command, especially considering that the prevailing conditions existing in alluvial deposits are more in favour of reduction than oxidisation, for we find iron salts reduced to sulphide, and as gold is present in these sulphides which replace woody bodies, we are bound to conclude that conditions favourable to the solution are annulled, as that metal is thrown down and fixed in the solid state. If the gold has been refined by Nature, it is far more likely to have taken place in the outcroppings of the reef, and during the transport of the lump of gold to the creek, when it would be fully exposed to oxidising influences, than after it had settled on the bed-rock.

Another argument brought forward against the mechanical origin of nuggets is the statement that alluvial gold is finer in quality than reef gold. This matter requires more research, and to enable a fair comparison, one should be certain that the alluvial gold came from the particular reef with the gold of which it is compared. Even then several assays should be made and the mean taken, for the gold in different parts of a reef may vary in richness. Many comparisons have been made between alluvial gold and a bar of gold obtained by amalgamation of quartz gold from its neighbourhood. This is obviously an unfair comparison, for there may have been silver minerals present that were easily decomposed and amalgamated, thus lowering the fineness of the bar gold. Taking the average of reef and alluvial gold, however, the difference in fineness, as a rule, is very slight, especially in cases of rich gold, while instances have been known of alluvial gold having been poorer than that of neighbouring reefs.

One difficult point for the supporters of the chemical theory to overcome is, how to account for the presence of quartz, clay, and oxide of iron in nuggets, which are almost invariably present. The "Welcome" nugget, found at Ballarat in 1858, at a depth of 180 feet, had a gross weight of 2217 ounces 16 dwts., but it contained about 10 lbs. of quartz, clay, and oxide of iron. At the same time, instances have been known of nuggets which were practically pure metal. One such nugget was found at Ballarat in 1860, which weighed 834 ounces.

Large nuggets are frequently, though not invariably, accompanied by smaller ones, which may have broken off the original piece, and it is certainly difficult to understand why gold nuggets should have been concentrated in one place more than another if they were brought there in solution.

Some objectors to the mechanical theory maintain that if gold was derived from reefs we ought to find crystals in our alluvial gold; but then crystals are rare, even in reefs, and any projections of rough gold would be flattened down and rounded off by pebbles rubbing against them; even the interior of cavities would be smoothed down by sand and small stones kept in motion, and circulating in such cavities by means of water. Moreover, we find mammillary structure in reef as well as in alluvial gold. Nuggets, however, do have a crystalline nature, for Professor Liversidge, in a paper lately read before the Royal Society of New South Wales, but not yet published, states that when a nugget was sliced through and polished, and then etched by chlorine water, that the surface was found to exhibit a well-marked crystalline structure, closely resembling the Widmanstatt figures shown by most metallic meteorites, only in the case of gold nuggets the crystals were more or less square in section, and showed faces which evidently belonged to the octahedron and cube.

(To be continued.)

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* R. B. Smyth, "The Gold Fields and Mineral Districts of Victoria," p. 356.

THE MINES OF ELBA.*

By HERBERT SCOTT, Fellow of the Geological Society of Italy.

WHILST stationed on the Island of Elba for the last two years as chemist at the iron ore mines, under Mr. Edward Riley, of London, I made a special study of the island, and its iron ore mines in particular. Some of my observations and conclusions I have now pleasure in presenting to you, and I am emboldened to do so by the fact that the information, especially that written in the English language, about the minerals on the island is very scanty and untrustworthy.

The Island of Elba is situated off the coast of Tuscany, about 9 miles from Piombino, and 11 miles from the ancient Etruscan town of Populonia. It is famous for its iron ore mines, its extraordinary diversity of minerals, its most interesting and altogether unrivalled geological formations, its healthy climate, and for its having been for about nine months the little kingdom and whole realm of the great Napoleon, who at one time thought Europe too small an empire.

Its inhabitants number about 25,000, and are a peaceful, industrious people. About one-third of the population are supported either directly or indirectly by the mining industry, and inhabit the several mining villages of Porto Longone, Capoliveri, Rio Marina, and Rio Alto; the remaining 17,000 being engaged in vine culture or other agricultural pursuits.

The island is very mountainous, and would be almost uninhabitable but for the existence of several springs, which afford an abundant and never-failing supply of pure water to the inhabitants. It is generally supposed that this supply comes from the hills of Corsica, the nearest of which are about 45 miles distant. The mountains on the mainland of Italy are about the same distance away, so that the water has to travel a considerable distance underground—in any case at least 9 miles of the distance being under the sea.

The healthiness of its climate is proverbial, and it has been well named a second Riviera. Especially healthy is it when compared with the climate of the neighbouring coast of Tuscany, which for months in the year is infested with malarial fever.

Geologically it is said to contain in miniature all the different rock formations and minerals of the Apennines.

It is known to Italian geologists as the "mineralogical cabinet," and is the recognised field for the young mineralogist in search of specimens.

Besides its iron ore mines, regarding which I shall speak at length, the following minerals occur, and are worked to a greater or less extent:—

Braunite	Pyrolusite	Galena	Cerussite
Copper pyrites	Erythrine	Ilvaite	Cassiterite
Copperas	Granite	Blende	Marble
Malachite	Asbestos	Quartz	Mica
Fireclay	Graphite	Steatite	

and also a mineral called Baldisserite, locally misnamed "Kaolino," which is a mixture of magnesium carbonate and silica, formed by the alteration of serpentinous rocks. It is exported largely for use in the manufacture of pottery. Besides the foregoing, the following precious stones occur in the granite of Monta Capanne on the west side of the island—viz., emerald, tourmaline, opal, beryl, and garnet.

History of the Mines.

The iron mines of Elba have an unequalled history of over 40 centuries, so that their origin is buried in the remotest antiquity. Unfortunately, little is known of their early history, except what Pliny, Aristotle, Virgil, and others say regarding them.

I propose, before going on to describe the mines, to give a few extracts and references proving the great antiquity of the island as a centre of mining industry.

The word Elba is derived from the Greek word "Ethalia"—meaning "blazes of iron furnaces," and was doubtless so called because, when discovered by the Greeks, they found iron furnaces were working there.

In removing some very ancient rubbish at the mine of Rio Marina, a few years ago, stone implements and other objects of the Stone Age were discovered. This seems to show clearly that iron ore was excavated for industrial purposes before the end of the Stone Age, and substantiates the assertion that weapons and armour made from Elban iron were used at the siege of Troy, 1280 years B.C. Virgil (see "Æneid," Book X., p. 174) speaks of the mines as being inexhaustible. He says:—"Insula inexhaustis chalybium generoso metallis."

Undoubtedly the Greeks were the greatest metallurgists of ancient times; and, indeed, the Etruscans learnt the arts of civilisation from the Tyrhennian Greeks, with whom they coalesced centuries before the foundation of Rome. Tradition says that the Queen of Syracuse smelted the ore brought by her ships from the Island of Elba.

The kingdom of the Etruscans, "Etruria," now called Tuscany, was ages ago of great commercial importance, and it gained industrial knowledge from all countries round about it, so it may safely be assumed that, after the Syracusians, the Etruscans were the next to smelt the Elban ore. After the war between the Romans and Etruscans, 507 B.C., one of the conditions of peace enforced by the victorious Etruscan Kings was the prohibiting of iron ore being used by the Romans, except for agricultural purposes. It may safely be said, however, that this was soon disregarded, and it does not require a great effort of imagination to believe the assertion that the subsequent supremacy of Rome over the then known world was due in no small measure to the use of iron smelted from the ores of Elba.

Diodorus Siculus, an historian who lived in the time of Cæsar and Augustus, says that Elba was famous for its iron ore. He describes the smelting of the mineral in furnaces and the making of blooms, which he says were carried to Pozzuoli, near Naples, where they were worked up into all kinds of implements.

Of Populonia, situated on the mainland almost opposite Elba, a town which was once the Sheffield of the Etruscan kingdom, nothing remains to tell the tale of its former prosperity but heaps of slag and the ruins of its walls. It is known, however, that during the second Punic War, Scipio having demanded resources from the Etruscan towns, was supplied with iron from Populonia.

Elba does not appear to have been thickly populated, as Virgil says of the forces that were sent to help Æneas:—"Whereas the whole of the Island of Elba sent 300 men, Populonia sent 600"; and speaking later of the embarkation, he says:—"600 left Populonia, and 300 were from Elba, which produces so much iron that the men were even clad from head to foot in armour."

Populonia is one of the few places where real Etruscan coins have been found; they point to its being an iron-producing centre, as on the obverse is represented the figure of "Vulcan," and on the reverse a "hammer and tongs." This ancient town probably owed much of its importance to the impregnable position which it occupied on a high cliff, whereby it was secure from the attacks of the pirates which at that time infested the Mediterranean. The ore from Elba seems to have been smelted preferably at Populonia, probably because of the fact that the district was, and is still, surrounded by forests; whilst Elba, owing possibly to its rocky nature, has always been scantily wooded.

Pliny speaks of iron forges being in use all over the island, and certainly remains of old slag heaps are to be found everywhere, so that whether the fuel used had came from the mainland or been produced on the island is of little moment, as it may be certain that much iron ore has been smelted on the spot.

The slag remains are nearly all found on eminences along th coast, showing that the ancient workers tried to get a good draught by putting their furnaces on elevated ground. Although slag can be found in large quantities everywhere, practically nothing can be seen of the remains of furnaces. Only at a place called "Lentisco," on the private estate of the late Signor Tonietti, lessee of the mines, did I ever find any remains of interest. I conducted some exploration and research work at this place, and unearthed a large quantity of fire-bricks, slags, &c., but, unfortunately, I was not able to get any very clear idea as to the shape of the furnace.

Aristotle gives a vague account of the method used for reducing Elban ore in ancient times; but according to Phillips' "Metallurgy," I find that the method of reduction known as the Corsican process was in use on the Italian side of the Mediterranean for some centuries. For the following particulars of the process I am indebted to this work:—

The furnace had two walls—one perforated by the tuyere and the other at right angles to it, faced with an iron plate containing the slag-hole.

The basin was enclosed by lumps of ore, and the interior of the basin was divided into two parts by a horse-shoe wall of large pieces of charcoal, which enclosed a smaller interior wall with a larger outer one between itself and the outside wall. The exterior space was further divided into boxes by two radial ribs projecting from the wall of charcoal. The outer cells were filled with small ore previously calcined, the inner one by charcoal.

The heap contained about 10 cwts. of ore, and was well covered by charcoal dust. The first, or roasting process lasted an hour, and when finished the masses of conglomerated ore from the outer chambers, and from the friable outside walls, were broken up and mixed together.

The half-reduced conglomerate was now totally reduced with charcoal, and when the iron had become a coherent mass at the bottom, decarburisation was completed by the addition of a small quantity of finely-divided ore. The bloom was then removed and hammered,

The slag consisted of a ferrous silicate, $2FeOSiO_2$, formed by a portion of the iron in the partially reduced ore combining with the siliceous matter of the ore. The operation of reducing 10 cwts. of ore took 24 hours, and the nett yield was only 40½ per cent. out of the 65 per cent. of metal in ore. The consumption of fuel was enormous, being about 9 tons per ton of iron produced.

Although pieces of iron produced by these furnaces have been found from time to time on the island, I am sorry I have not been able to acquire any specimen for analysis.

I have, however, analysed a piece of the slag, with the following result:—

	Per Cent.	
Silica	16·150	
Alumina	4·720	
Ferric oxide	12·000	
Ferrous oxide	60·560	
Oxide of manganese	nil.	
Oxide of calcium	1·750	
Oxide of magnesium	2·150	
Oxide of copper	nil.	
Phosphoric acid	0·170	P = 0·075
Titanic acid	0·250	
Sulphuric acid	0·375	S = 0·150
Arsenic acid	nil.	
Combined water	1·400	
Water at 212° Fahr.	0·600	
	100·145	

You will notice that the phosphorus is rather high; it may be accounted for by the fact that the place "Lentisco" is near the Calendozia Mine, which I shall have occasion to refer to later on as being somewhat phosphoric.

No one knows to whom the mines belonged previous to the eleventh century, but from that time onwards they were owned by whatever power had the sovereignty of the island.

When the Pisans acquired the island from the Emperor Henry VI., they, by an agreement signed in 1193, obtained the "gius regale" of the mines.

In 1290 Elba was taken by the Genoese, but the Pisans bought it back again in 1309 for 56,000 florins, equal to about £30,000.

In 1392 Jacob di Appiano, the deceitful secretary of Piero Cambacorti, took possession of the Government of Pisa, and in 1398 Gherado, his son, succeeded him. This Gherado di Appiano sold Pisa and its surroundings to Galeazzo, Duke of Milan, keeping only the Tuscan Islands and the Principality of Piombino.

In 1600 the Appian line was extinct, and then Niccolo Ludovisi, Prince of Venosa, paid for the State of Piombino 1,000,000 gold florins.

According to a document dated 1621, the net revenue of the State of Piombino amounted to 34,890 scudi of gold, equal to £15,000, and the revenue from the mines alone was equal to 90 per cent. of this sum.

Ludovisi was succeeded by the family of Boncampagni Ludovisi, who had the same rights over the mines as their predecessor. They kept the Principality of Piombino till 1801, when the last of their line, Don Luigi, was deprived of it by the French.

Elba at that time was subject to three powers:—The Grand Duke of Tuscany held Porto Ferraio, the capital of the island; the King of Naples held Porto Longone; and the other parts of the island, including the mines, were under the Princes of Piombino until they were taken from them by the French.

In 1814, for the first and only time in their history, the ownership of the mines was vested in the Government of the island, Napoleon I. being King; but when in 1815 he escaped, the island again became the property of the Princes of Piombino, and later on, together with that principality, were merged in the Duchy of Tuscany; and finally, after having been under so many different powers, they became the property of the Crown of Italy on Tuscany declaring itself a part of united Italy.

In very remote times the annual production of the mines was small, but it notably increased during the second half of the present century.

The quantity of ore excavated during the first 3000 years, or up to 1751, would be at the rate of about 4000 tons a year; and during the 100 years to 1851, the annual production was still small, not being more than 14,000 tons; but in the 30 years from 1851 to 1881, whilst the mines were being worked by a syndicate, in which the Government themselves were interested, the annual average production rose to 120,000 tons; and in 1881, nearly 400,000 tons were excavated. Fearing that this gradually increasing production would endanger the future of the mines, the Government in 1881 fixed the maximum annual quantity to be exported at 200,000 tons, and later in 1885, at 180,000 tons, at which figure it now remains.

The quantity of mineral supposed to be available for industrial use was very much exaggerated previous to an accurate examination of the mines being made. Indeed, some people went so far as to say that there was more than 100,000,000 tons of "gettate," or "refuse of the ancients," at Rio. The first examination of these deposits was made in 1867, when a proposal was presented to Parliament to let the mines to a private company. As a result, it was announced that 20,000,000 to 25,000,000 tons of ore could be counted on, and generally speaking, most people believed that the mines had a long and prosperous future before them.

In 1878 another proposal was mooted—to lease the mines to a private company for 40 years, on consideration of their putting the steelworks, &c., in Italy, but the same fate befell this proposition as the previous one, and it was not accepted by Parliament.

In 1879 one of the Government Inspectors of Mines made a rough examination of the deposits, and estimated the amount available at 10,000,000 tons; and in 1884 a detailed examination was made at the expense of the Italian Government, which returned 8,000,000 tons as the minimum quantity of ore available. Since then, however, 10 years have passed, and about 1,800,000 tons have been excavated, so that it leaves, according to the above figures, 6,200,000 tons yet remaining to be mined.

Geological Features.

Having stated what is known of the history of the mines up to recent times, I shall now briefly point out the geological and other features of the beds and surrounding country. The ores of iron occurring in the greatest quantity are—Specular ore, micaceous ore, red hematite, limonite, gothite, and magnetite, whilst marcasite and spathic iron ores are found in small quantity.

The deposits are, to all intents and purposes, superficial, and have been proved to have no great depth.

The rock formations on which the masses of ore rest are mostly schists, pudding-stone, and gneiss.

The beds of ore have no intimate connection with the bedrock, but appear to have been superficially deposited at a relatively not very remote period, in cavities formed by the solvent action of metalliferous solutions that contained the iron afterwards deposited.

The iron ore deposits are situated along the east coast of the island, lying almost in a straight line drawn north and south, and 11 miles from one extremity to the other. They are without exception found in close proximity to the sea, and for that reason their working and the transportation of the ore is comparatively easy. They occur in four principal masses:—

A. Rio Albano and Calendozio.
B. Rio Vigneria and Giove.
C. Terra Nera and Capo Bianco.
D. Calamita.

Although other small deposits are found in different places.

A. Rio Albano and Calendozio being the most northerly deposits, I will treat them first. Here the ore is found mostly as hematite, but specular iron, limonite, and very occasionally magnetite also exist in quantity. The deposits and workings are on the side of the mountain, the highest being about 820 feet above the level of the sea.

The ore is in contact and mixed up with a Liassic vari-coloured schist, and excavating work shows that the mineral alternates with the schist many times before arriving at the pudding-stone or Permian quartzite, which has proved to be the bedrock, and below which it is very generally supposed that no mineral exists. Fine veins of ore, more especially specular, occasionally penetrate the pudding-stone, but are never found to any considerable amount.

At Calendozio the bed of ore forms a cap on the mountain. The ore on the surface is usually limonite, with hematite and specular ore lower down. On boring, there was proved to be 56 feet of ore. The drill traversed a bed of schist below the superficial bed of ore, but came on the mineral again lower down, as at Puppaio.

On the northern side of the mountain of Calendozio the mineral meets the Infraliassic limestone. Traces of silicates of iron are found, and lower down, on the eastern side, huge blocks of specular ore occur on the surface.

In many places at Rio Albano large quantities of refuse left by the ancients, more or less rich in iron, have to be removed to get at the underlying mineral. This ore has not been noticed by the early workers, because it is covered by the vari-coloured schists.

At Rio and Vigneria the ore rests on Permian micaceous schists. The mineral mass of Rio at one time filled a large valley.

Immense heaps of refuse are shown on the right and left of the deposit, and at a greater height than it. This refuse, which is now shipped after washing, came from the working of a bed of ore quite on the summit of the hill; in fact, it once covered up the two basins of ore now being worked—viz., "Le Fabbriche" and "Pozzo-Fondi." Only when this refuse was found to be saleable, and washing machines put up, was this great basin of mineral found, which has yielded practically all the ore from the Rio district for the last 20 years.

The "gettate," or refuse ore, originally amounted to some 5,000,000 tons, but large quantities have been washed and exported during the last 20 years. The working called "Le Fabbriche" provides all those most beautiful crystals of specular ore which have made a world-wide name.

The mine of Vigneria, close to Rio, and which is now supposed to be nearly exhausted, gives one a very bad impression on first seeing it. Everywhere huge dump heaps, all more or less rich in iron, are to be seen, showing to what an extent the mine was worked 20 years ago. The mineral rests on Permian mica schists, and the bed has a thickness of about 50 feet. Underneath the bed the decomposed and whitened schist, Bianchetto, contains a little pyrites. It is, however, specular ore of the first quality, second only to that of Rio. A large amount of slag is found here lying on the ore deposit. Here, too, as at Rio Albano, the specular ore is occasionally found injected into the bed-rock, but not in any large quantity. On the summit of the hill a large quantity of specular ore and limonite is found at Rosseto, which, without doubt, has replaced the adjacent Infraliassic limestone. In one place the ore is seen passing under the limestone. The average thickness of the bed is 56 feet. Where the ore meets the limestone it has the line of demarcation clearly defined.

At the town of Rio, across the valley, there are large quantities of silicates of iron, ilvaite, augite, &c. The silicates are undoubtedly allied to, and due to the same cause, as the beds of Rio ore, the only difference being that the silicates have been formed in close relation to silicious matter. Specular ore is found mixed up with the silicates. In no place is the alteration of the silicates to limestone seen so clearly.

Giove.—This mine is now almost worked out, but it is rather interesting from the fact that the mineral is found in small veins in the pudding-stone, whilst it is entirely absent from the schists with which it alternates. Perhaps this is to be explained

* A paper read before the Iron and Steel Institute.

by the fact that probably the metalliferous solution containing the iron would penetrate more easily the fractures of the quartzite than the impenetrable schists.

Terra Nera is near the Gulf of Longone, and has been largely worked. It is formed of compact beds of specular iron, immediately over mica schist of Silurian age. On the east side, where excavations are now taking place, one can see the mineral alternating with the schist, but such layers are in reality lenticular masses running out to a sharp edge in the interior.

At Terra Nera huge heaps of refuse ore are to be seen, and occasionally lumps of rich ore are found mixed up in them. There is also a considerable quantity of slag, which points to the fact that a fair amount of smelting has been done here. A rather extensive bed of iron ore exists below the sea-level, and is now being worked successfully, but working below the level of the sea at Elba is somewhat difficult, owing to the primitive methods of working employed.

Terra Nera mineral is absolutely the richest worked on the island. Probably at one time the Terra Nera deposit was united to that of Capo Bianco, which is a cap of limonite rich in manganese, and containing a little titanic acid, and which seems to have substituted the Infraliassic limestone, as at Calendozio and other places.

The bed of ore at Calamita, in the south-east of the island, which consists of hematite, limonite, &c., and occasionally magnetite, was at one time supposed to be the largest of the Elba iron ore deposits; but I think, from a commercial point of view, its importance has been exaggerated, owing to the apparent vastness of the superficial mineral.

Cape Calamita is formed on its eastern side of augite and ilvaite, and on its western side of dolomitic limestone. At the main working called "Francosche," the beds of ilvaite and ore alternate, and they take the same inclination as the limestone underneath. The natural cutting in the west side of Calamita shows the limestone residues in the ilvaitic mass, and in one case two limestone layers enclose a deposit of hematite. The deposit of Calamita has made itself famous because it has furnished so much magnetic iron ore.

Reclus in his splendid "Manual of Geography" alludes to a fact not mentioned by any other author who has treated of Elba, that in olden times a piece of Calamita magnetite was used by sailors to guide their ships whilst the Pole-star was hidden by floating it on a piece of cork in a bowl of water.

The mineral mass of Calamita is found under different conditions to the rest of the beds, consisting as it does of masses of hematite enclosed in an ilvaitic augitic mass. The mineral is very rich, but owing to its being so intimately mixed with the silicates of iron and with limonite, care has to be exercised in shipping to keep up the percentage of iron, and thus enable it to be placed on the English market. Only a small quantity of refuse of the ancients is found at Calamita, showing that in olden times the mines were not much worked. In the working called "Vallone," limestone and iron ore are seen alternating beautifully. Traces of copper are found in the ore, but not to any deleterious extent.

Iron ore deposits are found under exactly the same conditions as at Elba on the mainland—viz., in contact with limestone, silicates, and schists. At "Val D'Aspra" there is an immense limonitic bed some distance away from the sea, and it has clearly replaced limestone, and lies on mica schists.

With regard to the age of deposits, the eminent Italian geologist, Eug. Lotti, says that, in view of the fact that the ore is found injected into the different formations, Pre-silurian, Silurian, Infraliassic, Liassic, and Eocene, it is evident they are more recent that the Eocene.

(To be continued.)

TIN TICKETING.

A TICKETING for tin ores was held at Tabb's Hotel, Redruth, on Tuesday, with the following result:—

VALUES OF ORES SOLD BY EACH MINE.

Mines.	Tons cwts. Tons.	Per ton. £ s. d.	Value. £ s. d.
Wheal Grenville a	19 0	£42 5 0	£802 15 0
do b	18 0	42 10 0	765 0 0
do No. 2	4 0	26 7 6	105 10 0
East Pool a	17 0	37 10 0	637 10 0
do b	17 0	37 5 0	633 5 0
do No. 2	1 10	18 10 0	27 15 0
Carn Brea No. 1	17 0	35 7 6	601 7 6
do No. 1a	16 0	35 12 6	570 0 0
do No. 2	1 0	26 5 0	26 5 0
Dolcoath No. 1	17 0	41 12 6	707 12 6
do No. 1 a	16 0	41 17 6	670 0 0
Tincroft	15 0	35 10 0	532 10 0
do	15 0	35 5 0	528 15 0
do	3 0	30 12 6	91 17 6
Wheal Basset No. 1	20 0	42 15 0	855 0 0
do No. 2	3 10	31 15 0	111 2 6
South Frances No. 1	11 0	39 15 0	437 5 0
do. No. 1 a	11 0	40 2 6	441 7 6
West Kitty	13 0	42 5 0	549 5 0
Phœnix United	12 0	42 7 6	508 10 0
Killifreth	10 0	39 15 0	397 10 0
South Condurrow	7 0	42 17 6	300 2 6
	264 0		£10,300 5 0

Average price per ton, £39 0s. 3d.

AVERAGE PRICES PER TON.

Feb. 12	£34	5	6	April 9	£36	7	6
Feb. 26	34	3	7	April 16	36	17	1
March 12	34	3	7	May 7	37	12	2
March 26	35	19	11	May 21	39	0	3

POORMAN GOLD MINES.—The first ordinary general meeting of this company was held on Tuesday, at Winchester House, E.C.—Dr. Bryson, who presided, said there was very little to report. Unfortunately, a great portion of the time already spent was taken up by the attempt to raise money by debentures. The promises received from about one-third of the shareholders were so satisfactory that the directors thought that what might be subscribed by the remaining two-thirds would be ample for the £30,000 that would be required. Accordingly the company was registered on January 31, but as many of the promises were not fulfilled, the scheme fell through. The American creditors were now paid off, and the company was in possession of the mine, with perfect titles. The shilling a share gave £42,600, and the total expenses to date were nearly £2000, including £2000 remitted to the manager. About £33,000 would be expended until the time that the mill should be producing, and there would be left to the company £10,000 or £11,000, which would be sufficient to pay for the new 20 stamp mill that it was expected to erect in the spring.—A vote of thanks to the Chairman terminated the proceedings.

OVERHEARD IN A 'BUS.—"Sir, you are a clumsy fellow—you trod on my foot." "I am extremely sorry—I hope I did not hurt you very much." The soft answer turned away the other's wrath, and even produced an apology. "Oh, no, not very much—you must excuse me, I am a little irritable—fact is, out of sorts, liver, biliousness, and that sort of thing, you know—thoroughly wretched." "My dear sir, of course I excuse you, but why don't you take something?" "Tried everything—no good." "Nonsense, you haven't tried Holloway's Pills, I know—they never fail in cases like yours." "Gad! I never thought of 'em By jove! I'll try 'em at once. Hi! conductor, stop the 'bus."

METAL MIXERS.*

AS USED AT THE WORKS OF THE NORTH-EASTERN STEEL COMPANY (LIMITED).

By ARTHUR COOPER, Member of Council.

THE North-Eastern Steel Company's Works were originally planned with the view of taking a portion of their requirements of iron in a molten state direct from blast-furnaces, the remainder from cupolas erected adjacent to the converters. A very short experience in the use of molten basic iron direct from the blast furnace as then made convinced the company that they could not depend upon getting such iron sufficiently regular in composition for use in basic converters, and after a very short trial the use of iron direct from the furnaces was abandoned. Additional cupolas were erected, and for eight years, ending December, 1892, cupola-melted iron alone was used from pigs made and supplied from six or seven different blast-furnaces in the neighbourhood. By a system of inspection and sampling of each delivery of pig, and a careful admixture of the different grades, fairly uniform results were obtained; but, notwithstanding every care, there were at times slight irregularities in the product of the cupolas, due to their irregular working; for although the iron charged was mixed to average a certain standard composition, it frequently happened that the molten iron from the cupola varied considerably in silicon and manganese, larger quantities of these metals being oxidised at one time than at another. These slight irregularities gave more or less trouble, and required more or less care and attention in the subsequent conversion of the iron into steel. This was the position when the metal mixer was first brought under the author's notice by Mr. David Evans (at that time general manager of the Barrow Hematite Steel Company (Limited), who had recently erected at the Barrow Works a mixing plant for use in their hematite process, and who very kindly placed at the author's disposal results of its working at those works.

About this time Mr. Massenez, at the Hœrde Works, in Westphalia, demonstrated that, by the use of mixers he had there erected for the basic process, a large reduction of sulphur took place, provided the molten iron contained 1 per cent. and upwards of manganese. He also satisfied the author that great regularity in the composition of the iron could be obtained from the mixer when working on molten iron direct from blast-furnaces.

Very soon afterwards a license was arranged by the North-Eastern Steel Company (Limited) with the owners of the patents, and a mixer was erected at the North-Eastern Works of 150 tons capacity. The form of the vessel adopted was that in use at Hœrde, but the arrangements for tilting it were somewhat different. Instead of a hydraulic cylinder fixed underneath the vessel, as at Hœrde, the plan designed by the North-Eastern Steel Company for tipping provided for fixing the hydraulic cylinder overhead, the piston-rod of which is attached to a cross-head coupled up to each side of the back end of the mixer by long links. This arrangement was devised because it was considered to be safer in case of a break-out than the hydraulic cylinder placed underneath.

The plant originally included:—One mixer vessel, as above described; a weighing-machine, on which the ladles of molten iron could be weighed before their contents were tipped into the mixers; another weighing-machine under the mouth of the mixer, for weighing the molten iron as it was poured into the ladle, the beam of this latter machine being placed on the upper stage, close to and well in sight of the attendant, whose duty it is to tip the molten iron into the ladles.

The plant was erected at the side of a slag tip on the eastern boundary of the works, in such a way that the approach to the tip forms an incline, on which the molten iron is raised from the works level to the level of the mixer.

The objects the company had in view in putting down this plant were: to increase their supply of molten iron in order to meet the gradually-increasing demand for basic steel without adding to their cupola-melting plant, then working at its maximum capacity, and at the same time to correct, if possible, the irregularities of the cupola-melted iron referred to in the early part of this paper, the intention being that the product of five blast-furnaces in the immediate neighbourhood of the works should be passed through the mixer to the converters, and the remainder of the molten iron required would be supplied by the cupolas. At first, blast-furnace iron only was used in the mixer in quantity amounting to about 2000 tons per week, and this was treated separately in the converters (*i.e.*, quite independently of the cupola iron); then the ladles supplying the converters were filled half with mixer iron and half with cupola iron; but after a very short trial it was apparent that the most regular and by far the best results were attained by passing the cupola iron also through the mixer. It was likewise clear that this was beneficial to the working of the mixer itself, as from the first trials the 2000 tons weekly of blast-furnace iron appeared to be barely sufficient to keep the heat in the mixer high enough to maintain the slag in a fluid state—a condition absolutely essential to successful working. These early experiments were so encouraging that an additional mixer was at once erected, the same in every respect as the first one, so that with two vessels the lining of one could be repaired whilst the other was working; and, in order to save labour and time in discharging the ladles into the mixer, a small pair of engines and shafting were fixed on the wall at the back of the two vessels, by means of which, and an endless rope of spun-yarn placed upon a grooved pulley on the ladle-gearing, a ladle containing about 14 tons of molten iron is tipped in less than one minute. For several months the lining was made solely of fire-brick, and when it had worn too thin (generally after some six or eight weeks' work), it was replaced with an entirely new one; but during the last 12 months it has been the custom to repair the worn parts with ganister, just as acid converters are repaired, and by this means the cost of linings has been considerably reduced. The charging of the mixer is commenced soon after Sunday midnight, so that it may be full when the works start at six a.m. Monday; and it is a rule not to draw upon it at such a rate as to reduce the quantity of molten iron in the vessel below about 80 tons, until Saturday morning, when it is emptied, and if then no repairs are necessary the mouth is bricked up, and the cover over the charging hole is made air-tight with fire-clay. By these means the vessel is kept almost red-hot until the following Monday morning.

It is of the greatest importance that, when working, cold air be excluded as far as possible. This is effected by means of a close-fitting sliding door lined with fire-brick at the mouth, and a plate to cover over the charging hole.

From the beginning of May, 1893, the whole of the molten iron used, consisting of about 2000 tons of blast-furnace iron and 1800 to 2000 tons of cupola iron each week, has been passed through one or other of the two vessels, and the results have fully justified the company's expectations.

It must not be for one moment thought that a mixer will cure all the ills which beset a steelmaker; that by its use inferior and unsuitable iron can be made into good steel at a reduced cost. Such is not by any means the case. If very grey or very common white iron be admitted, it is almost certain that several casts of inferior steel will follow. It must also be remembered that there are certain charges to be defrayed—such as royalty, labour, maintenance of plant and tools, and haulage of molten metal—which, together, amount to a considerable item per ton of finished product. Still, notwithstanding this, there are certain great advantages to be derived from the use of mixers, for if ordinary care be taken to exclude extremes—*i.e.*, iron which is too grey or too white, as would be done if the iron were taken direct to the converters, very regular results can be obtained from blast-furnace iron alone; but if into this is poured, at regular intervals, about equal quantities of cupola iron melted from carefully-mixed pig—such as is done at the works in question—a converter metal can be maintained of an almost uniform composition, far more uniform than when the iron is used direct from the cupolas; and, provided the manganese in the iron in the mixer does not fall below 1 per cent, a considerable reduction in the sulphur is effected. Again, with a reserve of molten iron always available, the converting plant can be run to better advantage than when it has to depend upon the cupola or blast furnace. Lastly, by use of the methods above described, the weight of each individual charge from the mixer can be controlled within a few cwts. with far greater certainty than is practicable when each charge is tapped separately from a blast-furnace or cupola, and thus, with an almost absolutely constant weight of charge in the converter, carburising can be effected with much greater precision.

* Paper contributed to the Iron and Steel Institute.

PROVINCIAL SHARE MARKETS.

THE CORNISH MINE SHARE MARKET.

MR. SAMUEL JOHN DAVEY, Dealer in Cornish Mine Shares, Redruth, Cornwall, reports under date of May 23 (four o'clock) as follows:—We have had a quiet market this week, with but little alteration in prices. There is not much doing to-day. Following are quotations:—Blue Hills, ⅞ to 1; Carn Brea, 2⅜ to 2⅝; Dolcoath, 49 to 51; East Pool, 5⅞ to 6; Killifreth, 9s. to 11s.; Polberro, 1 to 1¼; South Crofty, ⅜ to 1; South Wheal Frances, ¾ to 1; Tincroft, 7¼ to 7⅝; West Frances, 1⅛ to 1¼; West Kitty, 6 to 6¼; Wheal Basset, 1⅝ to 2; Wheal Grenville, 16 to 16¼; Wheal Kitty (St. Agnes), ¼ to ½.

Mr. MICHAEL WILLIAMS BAWDEN, Mining and Assaying Offices, Liskeard, Cornwall, writes (May 23) as follows:—The mining market has been less active throughout the past week on the fluctuation in tin, but most shares are firmly held for a further advance:—Blue Hills, 12s. 6d. to 14s.; Carn Brea, 2⅛ to 2⅜; Cook's Kitchen, ⅜ to ½; Devon Consols, 33s. to 35s.; Dolcoath, 50 to 50½; Drakewalls, 2s. 6d. to 2s. 9d.; East Pool, 5⅞ to 6; Killifreth, 10s. to 11s. 6d.; Levant, 6 to 6¼; Polberro, 1 to 1⅛; South Crofty, 15s. to 17s. 6d.; South Frances, ⅜ to ½; Tincroft, 7¼ to 7½; West Frances, 1 to 1¼; West Kitty, 6 to 6¼; Wheal Basset, 1⅝ to 2; Wheal Grenville, 12¼ to 12½.

Messrs. ABBOTT AND WICKETT, Stock and Share Brokers and Mining Share Dealers, Redruth, write under date of Thursday, May 23:—Business in the Cornish Share Market during the past week has been fairly active, though the tendency is a little easier at the close in sympathy with tin. Most of the leading mines have received a moderate amount of attention, Dolcoath perhaps being the chief features. Quotations herewith:—Blue Hills, ⅝ to ¾; Carn Brea, 2¼ to 2⅜; Cook's Kitchen, ⅜ to ½; Dolcoath, 50 to 52; East Pool, 6 to 6⅛; Killifreth, 9s. to 11s.; Polberro, 1 to 1⅛; South Crofty, ¾ to 1; South Frances, ⅜ to 1; Tincroft, 7⅛ to 7⅜; West Frances, ⅛ to 1⅛; West Kitty, 6⅛ to 6⅜; Wheal Basset, 1⅛ to 2; Wheal Grenville, 12 to 12½; Wheal Kitty, ⅛ to ¼. Tin, 65½.

MANCHESTER.

Messrs. JOSEPH R. and W. P. BAINES, Stock and Share Brokers, Queen's Chambers, 7, Market-street, write May 23 (noon):—This week we do not need to go at any length into the changes in quotations. All sections of active stocks have shown fluctuations, and it merely remains to record the balance of alteration on the week. The settlement (not yet concluded) has been decided, but so far (though not without rumours) it has passed off pretty smoothly. The department in which trouble has been anticipated has been in Kaffirs, and at times this anticipation has caused some serious depreciation in values, only to find figures coming back again to the better side when the rumours have been unconfirmed. Home rails have been mostly a strong market, and on the week advances are distinctly in majority, the minority being a small one, and in most instances insignificant in amount. On the Yankee side values have declined with few and small rallies, almost daily resulting in a decline, which is all but uncontradicted all along the line. Trunk issues and Canadians generally have followed the lead of their yokefellows, and Canadian Pacifics are to the fore with fall of $1¾. Grand Trunk issues, whilst all lower, in no case approach 1 down. Mexican rails distinctly lower, particularly the preference issues. Consols have mended to the extent of ⅛. The only change in colonials is a rise of 1 in Canada Registered. Home corporation stocks have lulled a bit, there being no quotations altered either favourably or adversely. Foreigners are irregular.—Higher: Italian Rentes ⅛, Uruguay Three and a-Half per Cent. ½, and Portuguese Three per Cent. ⅛.—Lower: Brazilian Four and a-Half per Cent. 1, ditto Four per Cent. ⅜ to ½. Argentine Six per Cent. ¾, ditto Five per Cent. ½, Turks ⅛, and ditto D ⅛. As regards miscellaneous sections of the market nothing of any importance has occurred. In some mines and in Ship Canal issues a fair business has been done (in the latter at declining prices), but otherwise but little business has been reported. In banks, the balance of change is on the side favourable to holders; but in insurance, the majority is in the other direction. Generally speaking, coal, iron, &c., are better in the movements. Mines very contradictory, changes being evidently reflections of the position of the account in each particular share or class; but, on the whole, this section is below the record of a week ago. Nothing of special moment in the strictly "Miscellaneous." We may, however, mention rise of 2 in Imperial Continental Gas, 2 in Guinness Brewery, ¼ in Brunners; and fall of 1 in Suez Canal, ½ in Allsopp's, and ½ in Bell's Asbestos.

LATER (4 P.M.).—Home rails are better to-day, where changed prices being better. In Canadians, Pacifics have had another drop, but Trunk issues remain without quotable alteration. Americans began badly, and whilst some issues are lower, the majority are better on the day.

SCOTCH MINING AND INDUSTRIAL COMPANIES SHARE MARKETS.

STIRLING.—Mr. J. GRANT MACLEAN, Stockbroker and Ironbroker (May 23) writes:—During the past week there has not been so much business doing, although trade prospects are considered favourable. The intervening fortnightly settlement, accompanied by difficult continuation and realisations, has checked business to some extent.

In shares of coal, iron, and steel companies prices are steady. African Coal are at 9s. 6d.; Addie and Co. Preference, 10; Marbella, 50s.; Middleburg Coal, 8s.; Niddrie, 41s. 9d.; Steel Company of Scotland, 54s.

In shares of copper concerns a fair amount of business has been done. Prices are firm. Arizona improved to 30s., and are now 28s. 6d.; Mason, 57s. 6d.; Rio Tinto fell from 16 to 15⅛, but have recovered all the loss. Tharsis are at 98s. 6d.

In shares of home mines prices are steady. Great Laxey are at 33s. 6d., Killifreth and Wheal Basset 37s. 6d.

In shares of gold and silver mines a considerable amount of busi

ness has been done, but prices in some cases lower on realisations. St. Augustine Diamond have improved on the appointment of a new local director, who has acquired a large interest in the company. Wemmer have improved on the profit for last month, £9116. Chartered shares have been fluctuating daily. At one time they fell to 70s. 9d., then improved to 83s. 3d., and are now 76s. 3d. East Rand improved from 88s. to 5 3-16, and are now 93s. 9d. African Recovery are at 3ls.; African Estates, 46s. 3d.; Big Golden Quarry, 3s.; Bayley's Reward, 10s.; Balkis Land, 5s. 3d.; Broken Hill, 44s. 6d.; Buffelsdoorn, 5½; Caledonian, 4s.; Carata', 1s. 6d.: Consolidated Gold Fields of South Africa, 6½; Crœsus, 46s. 3d.; Doornkop, 12s. 6d.; Empress of Coolgardie, 14s. 3d.; Emma, 1s.; Gwelo, 5s. 3d.; Glencairn, 80s.; Guy Fawkes, 11s. 3d.; Graskop, 8s.; Golconda, 22s. 6d.; George and May, 25s. to 27s. 6d; Jumpers, 5½; Hauraki, 12s.; Idaho, 5s. 3d.; Komata Reef, 3s. 6d.; Londonderry, 13s.; Lisbon, 6s. 3d.; La Plata, 3s.; May, 68s. 3d.; Metropolitan, 55s.; Murchison Gift, 4s. 9d.; Montana, 12s. 6d.; Mozambique, 31s.; Moodie's, 30s.; Mawson's Reward, 20s.; Mallina, 16s.; New Randfontein, 76s. 3d.; Oceana Development, 18s. 9d.; Oceana Land, 56s. 3d.; Orion, 72s. 6d.; Pearl Central, 27s. 6d.; Randfontein, 41s. 6d.; Roodepoort Deep, 82s. 6d.; Royal Oak, 3s. 6d.; Rhodesia, 9½; Sheba, 38s. 6d.; Sherlaw's, 12s. 6d.; Spes Bona, 60s.; Springdale, 3s. 3d.; Spitzkop, 29s.; Sutherland Reef, 6s. 9d.; Sheba Queen, 5s. 6d.; Thistle Reef, 4s. 6d.; Transvaal Gold, 5½; Violet, 26s. 6d.; Victoria and Altamira Pref., 2s. 9d.; West Australian Exploring, 30s. and Zambesia, 61s.

In shares of miscellaneous companies, prices are steady.

In shares of oil companies prices do not show much alteration. The Pumpherston Company announce a dividend of 5 per cent. on the ordinary shares. Broxburn are at 12⅜; Linlithgow, 38s. 9d.; Pumpherston, 9 1-16; and Young's 44s. Nobel's Explosives are at 15 9-16; Roburite Explosives, 40s.; and White Lead, 2s. 6d. to 3s.

METAL CIRCULARS.

MESSRS. JAMES LEWIS and SON'S mid-monthly report on copper, dated Liverpool, May 16, 1895, has the following:—The market for copper has been more excited during the past fortnight than at any period since the days of the French Syndicate purchases—some seven or eight years ago—the result being an advance at one time of £4 per ton in the price of good merchantable copper, which rose rapidly from £41 on the 1st inst. to £45 on the 13th, falling back to £43 17s. 6d. on the 15th on realisation of profits, and closing at £42 10s. cash £45 for three months prompt. The business transacted has been enormous, amounting to about 20,000 tons in London alone, while in Liverpool and Glasgow purchases and sales have been on a large scale. The rapid advance in values was primarily due to the satisfactory progress made in the negotiations between American and European producers to limit the supplies of copper available for European consumption, the proposed agreement being that American exports should not exceed 60,000 tons per annum from the 1st of July next, against 77,000 tons last year and 79,000 tons in 1893, while European producers were to diminish their output from 5 to 7½ per cent. on that of last year. This represents a total reduction of about 24,000 tons, which, with the present expansion of trade and steadily increasing consumption of copper for electrical purposes, would lead to a great depletion of the public stocks in England and France, and consequent material advance in its value. Yesterday it was announced that although European producers had agreed to the terms proposed, the Calumet and Hecla Company had declined to sign any agreement, being debarred from so doing by the laws of the State of Michigan, which prohibit any combination to advance the selling value of any article produced in the State. It is, however, expected that an "honourable understanding" will yet be arrived at and present difficulties overcome, it being so greatly to the interests of the parties concerned that the value of copper should be raised from the low level prevailing during the past year, and which has made the production little, if at all, profitable to many of the largest mining companies. Very little copper is now offered for sale in Chili, nearly the whole production available for shipment for the next four months or five months being already sold, and the exchange having now nearly reached the Government limit of 18d., the chief inducement to producers to sell so far forward is removed. In New York, Lake copper has advanced from 9·75 to 10·50 cents—and is but sparingly offered, the home consumption being on a much larger scale than for some years past. At the annual meeting of the Boleo Company, of Lower California, held in Paris on the 30th ult., it was resolved to pay no dividend for the year 1894, carrying forward 2,518,730 francs to the credit of the profit and loss account, and to issue 6,000,000 francs of debentures to pay off advances made to the company. The production of this company for the year 1894 was about 10,500 tons. The dividend paid by Messrs. Mason and Barry (Limited) for the year 1894 is 2s. 6d. per share, or 3½ per cent., the production of copper being 3221 tons fine, against 3586 tons in 1893. The returns made by European and American producers are as follows:—

	April.		Four months.		12 months.	
	1895.	1894.	1895.	1894.	1894.	
European production ...Tons	7,219	7,385	29,119	29,634	88,505	
American production	11,944	12,475	45,711	47,311	142,473	
Do, imports	1,809	1,340	6,400	5,360	17,080	
Do, exports*	5,677	6,140	19,284	24,584	77,130	

*United Kingdom.....Tons 1449
France..... 1550
Germany, Holland, &c..... 1673
Mexico..... —
5677

For the past fortnight the exports are only about 1500 tons. Stocks have increased 60 tons, and the visible supply 580 tons during the past fortnight. Imports to date are 736 tons less, and deliveries 143 tons greater than last year. Arrivals in England and France for the fortnight have been 2803 tons, and the deliveries 2743 tons. The arrivals of Chili in Liverpool and Swansea have been 829 tons and the deliveries 503 tons, and from other countries 712 and 1173 tons fine respectively. The arrivals here and in Swansea from the United States have been 337 tons bars and 256 tons matte, equal to about 476 tons fine, and in France 910 tons fine. The Chili charters for the past fortnight are advised as 1100 tons, and exchange 17 1/16. Sales of furnace material have been confined to:—May 6th, 11 tons precipitate Spanish about 70 per cent., at Liverpool, on private terms. May 13th, 37 tons Chili ore at Swansea, at 7s. 9d. per unit.

Messrs. HARRINGTON and Co.'s Copper Report, dated Liverpool, May 17, 1895, says:—Chili charters for the past fortnight are cabled as 1200 tons, making the total since December 31 last 8350 tons against 6450 tons same time last year. Exchange 17d. During the past fortnight we have had a very excited market for G.M.B.'s, owing to all kinds of rumours being circulated regarding producers curtailing the output of copper and various other reasons for causing an advance in values. All this made the market quite rampant, and the business done from day to day was very important, reaching several thousand tons, but within the last few days the market has turned and the decline has been severe, as £44 16s. 3d. cash and £45 5s. three months were paid on the 13th, since when the fall continued, and to-day £41 18s. 9d. and £42 7s. 6d. respectively was paid, closing with buyers at £42 5s. cash and £42 13s. 9d. three months. This collapse in copper is said to be on account of the breakdown of the producers' negotiations, the Americans now declining to adhere to the proposed agreement. The following are the returns of the Copper Producers' Committee:—European production, 7219 tons for April, 29,624 tons for four months, 88,501 tons for all 1894, and 81,765 tons for all 1893. American production, 13,544 tons for April, 52,671 tons for four months, 159.5 2 tons for all 1894, and 142,490 tons for all 1895. Total, 20,763 tons for April, 82,305 tons for four months, 248,061 tons for all 1894, and 224,255 tons for all 1895. American exports, 5677 tons for April, 77,130 tons for four months, 77,130 tons for all 1894, and 80,387 tons for all 1893. The Copiapo Mining Company have declared an interim dividend of 1s. 6d. per share free of income tax, being at the rate of 7½ per cent. per annum. The total stocks in Liverpool, Swansea, London, and Havre are 5',799 tons against 50,239 tons on the 1st instant, showing an increase of 60 tons for the fortnight. The stocks include about 1000 tons of copper sold but not yet delivered to smelters. The visible supply for the fortnight is 55,0'8 tons against 54,438 tons on the 1st instant, showing an increase of 580 tons. Refined and manufactured sorts are quiet, quotations being—Tough cake £46 10s. to £47, best select £47 5s. to £47 10s., Indian sheets £50 to £51, strong sheets £52 to £53, and yellow metal sheets 4¾d. to 4⅝d. per pound. The sales of furnace material only comprise 11 tons Spanish precipitate on private terms, and 37 tons Chili ore at 7s. 9d. per unit. Import of Chili copper during the past fortnight 829 tons fine against 776 tons fine same time last year. Delivery of Chili copper during the past fortnight 503 tons fine against 4 0 tons fine same time last year. Import of other copper during the past fortnight 712 tons fine against 1564 tons fine same time last year. Delivery of other copper during the past fortnight 1178 tons fine against 1 08 tons fine same time last year. The total imports of Chili and other copper into Liverpool and Swansea since the 1st January have been 24,100 tons, deliveries during the same period 24,503 tons fine: for same time last year the figures were 27,734 and 26,647 respectively. Stocks of copper (Chilian and Bolivian) in first and second hands, likely to be available, we estimate at—Liverpool, 535 tons ores, 38,250 tons bars, 684 tons ingots; Swansea, 200 tons bars; total, 535 tons ores, 39,030 tons bars, 684 tons ingots, representing about 39,851 tons fine copper, against 39,525 tons May 2, 1895, price of cash bars £41 6s. 3d.; against 32,265 tons fine copper May 16, 1894, price of cash bars £39 8s. 9d.; against 30,432 tons fine copper May 17, 1893, price of cash bars £43 1s. 3d.; against 29,848 tons fine copper May 18, 1892, price of cash bars £46 18s. 3d.—Tin. The market for Straits since our last has risen and fallen in sympathy with copper, opening at £84 10s., cash prices advanced till £88 12s. 6d., was touched on the 13th inst., since which they have fallen away, closing to-day at £86 5s., Australian £86 12s. 6d., English £89, and Peruvian £88 to £90, according to quality. Sulphate of copper firm, at £15 10s. spot and forward. Lead during the past fortnight has been firm, and we quote £10 5s. for Spanish, and £10 7s. 6d. to £10 8s. 9d. for English.—Spelter. The market since our last has been firm, and prices advanced 2s. per ton, closing at £15 ordinary Silesian brands.—Quicksilver. Since our last the market has advanced, and closes firm at £7 3s. 9d. per bottle for Spanish.—Bar silver. The market has fluctuated between 30⅝d. and 30⅜d., closing to-day at 30⅝d. per ounce standard. Antimony quiet, Star regulus at £31 to £31 10s. per ton. Ore irregular, about £8 to £8 5s. for 50 per cent. good quality and produce. Bank rate of discount remains at 2 per cent.

Messrs. HENRY BATH and Son's fortnightly copper report, dated May 17, states:—The Chili charters for the past fortnight are advised as 1200 tons. The latest exchange is 17d. The fortnight opened with a firm tendency, and the price of G.M.B.'s rose from £41 5s. cash on the 2nd inst. to £42 by the 8th inst. The following morning it was rumoured that an arrangement to restrict production would be likely to take place between the American and European producers; the effect was immediate, for business opened at £42 15s. cash, a rise of 15s. on the night before, and we closed on that day at £43 12s. 6d. cash, and £44 three months. During the remaining days of the fortnight, the rumour referred to above being more or less confirmed, we have witnessed very heavy trading, 4000 to 5000 tons changing hands during the day, and prices were taken to £45 cash and £45 10s. three months on the 11th and 13th, but this was followed by a rapid reaction on pressure of sales, no doubt to secure profits. During the week until yesterday prices have fluctuated a good deal, the highest and lowest touched being £45 cash and £45 10s. three months, and £43 17s. 6d. cash, and £44 5s. three month. Yesterday morning several of the newspapers contained a statement that the Tharsis Company would not join the proposed combination, which we are authoritatively informed is not correct, but apparently some hitch in the negotiations has taken place in America, and in consequence we have to report business at £42 10s. cash, and £42 17s. 6d. three months. Before the close of first 'Change yesterday, however, £43 cash, and £43 7s. 6d. three months was paid, and we closed last night at £42 10s. cash, and £42 17s. 6d. three months, and to-day at £42 cash, and £42 7s. 6d. three months. Whatever may be the result of these negotiations we have the fact before us that the shipments from America for the past fortnight are only 1234 tons as against 27 0 tons the fortnight before, the price from New York being cabled at 10·62½ cents. From the tenor of the communications from the United States, it would appear as if they would not be in a position to export to Europe during 1895 more than at the rate of 60,000 tons per annum, which was the limit mentioned in their negotiations. The arrivals and deliveries at Hamburg, Rotterdam, and Antwerp during the fortnight amount to about 582 tons fine copper. Imports of American copper into England have been 476 tons, and into France 910 tons, or 1385 tons against 1122 tons last year. Actual deliveries for the fortnight have been 2743 tons, against 2803 tons imports. The stocks have increased 60 tons. Total visible supply shows 54,749 tons against 54,239 tons last fortnight. In furnace material the only transactions we hear of are about 37 tons of Chili ore at 7s. 9d. per unit, and 11 tons of Spanish precipitate to arrive, on private terms.

Stocks:—We estimate the present available quantities of West Coast copper to be:—

	Ores.	Regulus.	Bars.	Ingots.	Builis.
At Swansea	—	—	800	—	—
,, Liverpool	535	—	38,260	684	—
In France	—	—	120	70	60
	535	—	39,180	754	60

representing about 40,083 tons fine copper, against 39,807 tons on the 2nd inst., against about 32,898 tons fine copper May 16, 1894, against about 34,383 tons fine copper May 16, 1893, against about 33,818 tons fine copper May 16, 1892, against about 33,403 tons fine copper May 16, 1891.—Supply of West Coast copper may be estimated from the following figures: Actual stocks at Swansea, Liverpool, and in France 40,083 tons, afloat and chartered for at date of last advices per mail and telegram 3350 tons, total 43,433 tons against 42,807 tons, May 2, 1895; against same date 1894 stock 32,898 afloat, &c., 2300 = 35,198 tons, 1893 34,384 afloat &c., 3000 = 37,384 tons, 1892 33,818 afloat &c., 3300 = 37,118 tons, 1891 33,403 afloat &c., 2500 = 35,903 tons.

THE INSTITUTION OF CIVIL ENGINEERS.—At the last ordinary meeting of the session on Tuesday, May 21, Mr. W. H. Preece, C.B., F.R.S. (Vice-President), in the chair, it was announced that seven associate members had been transferred to the class of members, viz.:—William Henry Cole, Walter Edmund Cook, William Julius Mirrlees, B.Sc., James Smith Mollison, Oliver Claude Robson, Edward Brownfield Wain, and Alfred White. At the same meeting it was reported that 27 candidates had been admitted as students, viz.: Walter Lacy Allcroft, Taggart Aston, Charles Orr Campbell, Gaspard Robert de Mussenden Carey, Jesse Edward Chapman, Louis Whitfoot Clarke, William Harold Arthur Court, Alexander Gratitude Craig, B.Sc., Alfred Arthur Davis, Clement Frederick Davis, B.A., George Crosbie Dawson, Robert Manning Dowson, Haines Breebaart Ede, Arthur Grimshaw, John Inglis, B.Sc., James Gray Mathieson, Allan Macrae Moir, Harry Scott Morrison, John Leslie Mowbray, James Just Niven, Henry John Rofe, B.A., Leslie Roseveare, Charles William Scott, Benjamin Thomas Stubbs, John Taylor, Edward Lloyd Williams, and Hamilton Arnison Woods. The last ballot of the session resulted in the election of two hon. members—viz.: Octave Chanute, Chicago; and Henri Schneider, Le Creusot; of four members—viz.: Harry Victor Sampson Baker, P.W.D., India; Rawlinson Tennant Bayliss, Old Broad-street; George Humphreys, P.W.D., India; and Emanuel Alois Ziffer, Vienna; and of 38 associate members—viz.: Frank Joseph Agabeg, Sitarampore; William Banks, Rochester; Henry Kynaston Blake, Guildhall; Henry Lane Brown, Rhyl; Matthew Taylor Brown, B.Sc., Glasgow; Gerard Maclean Browne, Coolgardie; Robert Arthur Bruce, Bolton; Edmund Burrows, P.W.D., Cape Town; Frederic Edward Theodore Cobb, Geelong; Reginald Harratt Crompton, Stud. Inst. C.E., Transandine Railway; Henry Mangles Denham, London and North Western Railway; Arthur Montefiore Wire Easten, Johannesburg Railway; Herbert Francis Edwards, Cardiff; Harry Glen Finlaison, P.W.D., Egypt; James Forgie, Westminster; James Fraser, Railway Department, Sydney; William Willis Gale, East Grinstead; Bernard Godfrey, Stud. Inst. C.E., Droitwich; Louis Greene, Stud. Inst. C.E., Brighton; Joseph Hawksley, Portsmouth; Joseph Hope, P.W.D., Sydney; William Ingham, Plymouth; Edmund William Janson, M.A., Leadenhall Buildings; Charles William Jenkins, P.W.D., New South Wales; William Arthur Baird Laing, Edinburgh; William Robert Manning, Chelsea; Benoor Silvano de Mendonca, Rio de Janeiro; William James Milner, P.W.D., Sydney; Joseph Rushworth, Westminster; Joel Settle, Madeley, Staffs.; Joseph Shepherd, Leeds; Sophus Simmelkjær, Lothbury; Charles Edward Simpson, Beckton; Thomas William Loraine Spencer, P.W.D., New South Wales; Sidney Stallard, Stud. Inst. C.E., Maidstone; William George Walker, Westminster; Bertram Braund Waller, Eltham; and George Bliss Winter, Madras Railway.

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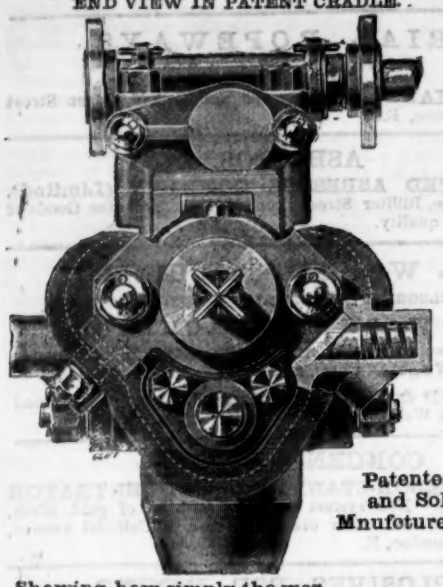

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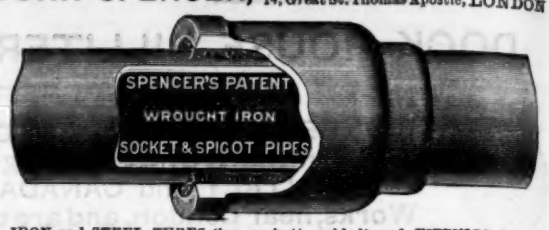

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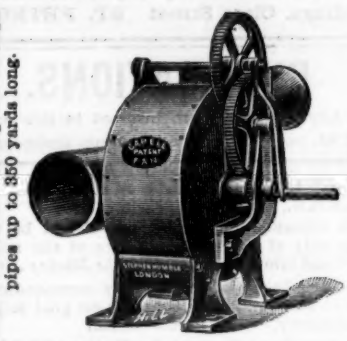

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